State and Federal Applications for Renewal of the Trans Alaska Pipeline System

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Appendix D
Historical Overview of North Slope Petroleum Development and *Exxon Valdez* Oil Spill

By B.J. Gallaway

D.1 Background

The modern history of petroleum development on Alaska's North Slope is generally considered to date from the late 1950s and early 1960s (Gilders and Cronin, 2000). However, oil seepages and oil-rich rocks in northern Alaska were known to Eskimos long before recorded history (Selkregg, 1975). In the early 1900s, E. de K. Leffingwell led a U.S. Geological Survey (USGS) expedition to evaluate the geology of arctic Alaska. Local residents identified the location of surface oil seeps, and this information was used in defining areas that might contain potential oil structures. Reports between 1919 and 1922 by the USGS and other government agencies documented oil seeps in the Smith Bay (Cape Simpson) region of the western Alaska Arctic and concluded that there might be petroleum at many places on the Arctic Coastal Plain and that there might be a more-or-less continuous oil-bearing belt extending across northern Alaska (Martin, 1921). This information contributed to the establishment of Naval Petroleum Reserve Number 4 (PET 4) by President Warren G. Harding in 1923. This area is now known as the National Petroleum Reserve-Alaska (NPR-A) (Figure D-1).

Shortly after Alaska obtained statehood in 1959, a large portion of the eastern arctic region was retained by the federal government with the establishment in December of 1960 of the Arctic National Wildlife Range (Figure D-1). The purpose was to preserve unique wildlife, wilderness, and recreational values while at the same time allowing for oil and gas leasing. The initial withdrawal involved approximately 8.9 million acres. The same land order opened the region between the Colville and Canning rivers to selection under the Statehood Act and to homesteading. The State of Alaska selected considerable acreage in the region, including the lands where the Prudhoe Bay and Kuparuk oil fields were later discovered. Land transfers ceased, however, when the Secretary of the Interior issued a land freeze in 1966, blocking further state selections until Native land claims were settled.

During the eight years between passage of the Alaska Statehood Act and the Department of the Interior's 1966 land freeze, title to approximately 12 million acres of public land was transferred to the state. Further land transfers within the state remained "frozen" until 1971 when Congress passed the Alaska Native Claims Settlement Act (ANCSA). Granting to Alaska Natives land selection rights to over 40 million acres, ANCSA paved the way for construction of the Trans Alaska Pipeline System (TAPS) and allowed state selections to resume. Section 17(d)(2) of the Act, popularly known as "D-2", authorized the Secretary of the Interior to withdraw up to 80 million acres of land for inclusion in national parks, wildlife refuges, forests, and wild and scenic rivers.

Although ANCSA opened Alaskan lands to state and Native selections for a brief time, a series of freezes was imposed on federal land transfers until the D-2 withdrawals were accomplished. After intense debate on management of federal lands in Alaska, Congress passed the Alaska National Interest Lands Conservation Act (ANILCA) on December 2, 1980, ending the uncertainty. ANILCA changed the name of the Arctic National Wildlife Range to the Arctic National Wildlife Refuge (ANWR) and added about 9 million acres to double the size of the refuge to approximately 19 million acres.

ANILCA reiterated the purpose for which ANWR was established including conservation of fish and wildlife populations and their habitats, fulfillment of international treaty obligations relating to migratory wildlife, continuation of subsistence uses by local residents, and maintenance of water quality. Section 304(a) requires that administration of the refuge be in accordance with laws governing the national wildlife refuge system, and Section 304(g) required preparation of a comprehensive conservation plan for ANWR.

In this context, a 1.5-million-acre area — the so-called 1002 Area — of the coastal plain within ANWR was segregated for resource evaluation because of its potential for crude oil deposits (Figure D-1). This area was specifically

addressed under Section 1002 of ANILCA, which required the Secretary of the Interior to report to Congress on a number of issues including:

- Identification by means other than drilling exploratory wells of the oil and gas potential of the ANWR coastal plain;
- Description of fish and wildlife, their habitats, and other resources in areas having oil and gas potential;
- Evaluation of adverse effects of further oil and gas exploration and production on wildlife and habitats;
- Identification of transportation systems for oil and gas development;
- Evaluation of the national need for development of ANWR oil and gas resources; and
- Recommendations on whether further exploration for, and the development and production of, oil and gas on the coastal plain should be permitted and, if so, what legal authority would be necessary to avoid effects on wildlife and other resources.

During the winters of 1983-84 and 1984-85, some 1,180 line miles of geophysical data were acquired for the 1002 Area. The U.S. Fish and Wildlife Service conducted baseline studies during 1980 to 1985 to determine the size and diversity of the fish and wildlife populations in the 1002 Area (Garner and Reynolds, 1986). A draft report was issued by the Secretary of the Interior in November 1986 followed by a final report in April 1987. In March 1987, the Secretary of the Interior recommended to Congress that the coastal plain be opened to development and published the final environmental impact statement (EIS) for ANWR exploration. Scientists began additional studies in 1987 to investigate the potential impacts of pending petroleum development in the 1002 Area on key fish and wildlife species and their habitats (McCabe, 1994).

Congress did not immediately take action to allow leasing and petroleum exploration and development in ANWR. From the beginning, petroleum development of ANWR has been a highly contentious issue. In 1995, the U.S. House and Senate finally approved coastal plain development as part of a balanced budget act, but the entire measure was vetoed by President Clinton. To date, Congress has not acted to allow leasing or development.

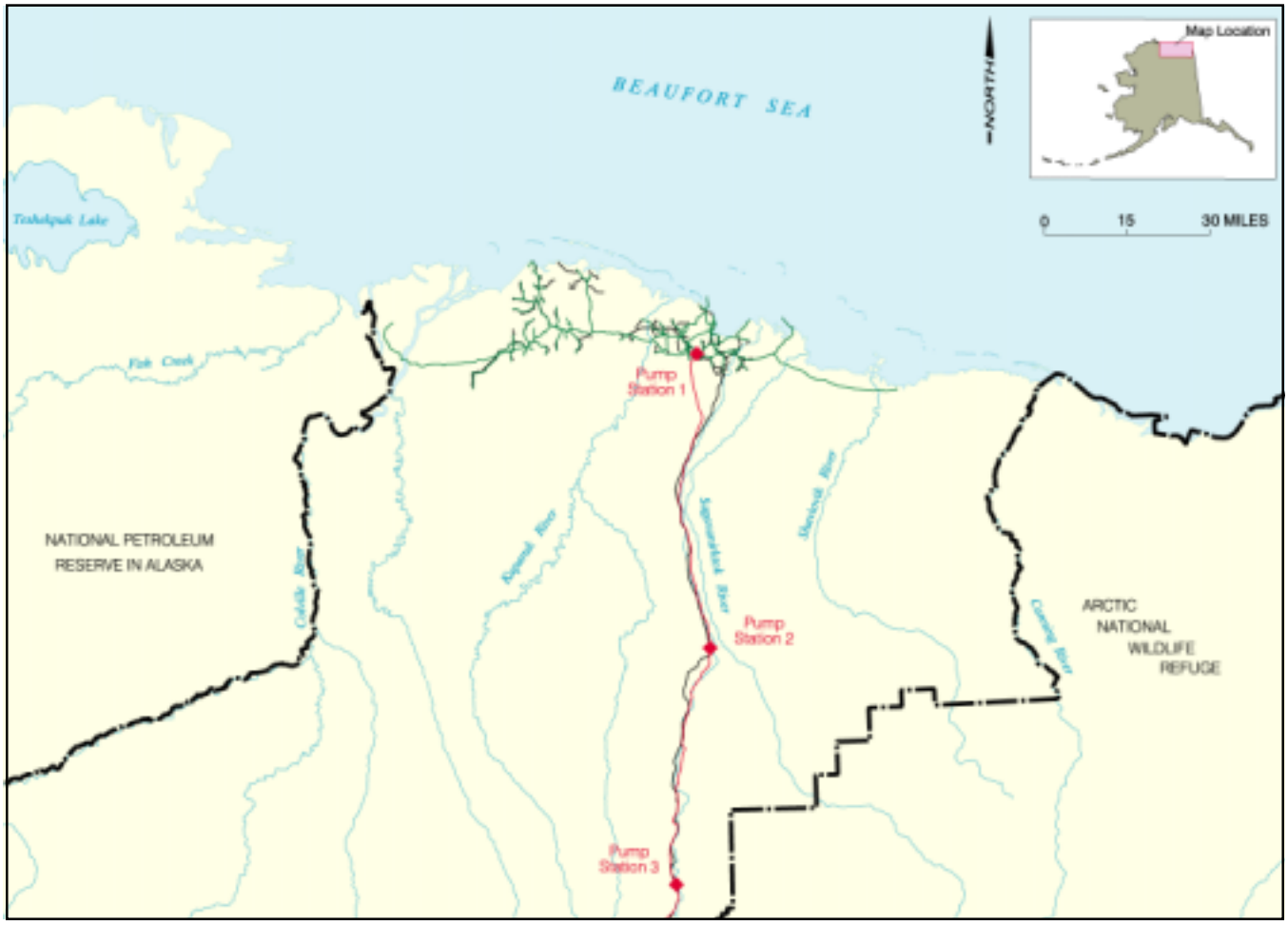

Figure D-1. *The Alaska North Slope in the oil field region.*

As noted above, the State of Alaska selected in 1964 most of the available land between the Colville and Canning rivers (the region between NPR-A and ANWR) and leased these lands for petroleum development. The discovery in 1968 of the Prudhoe Bay oil field has led to extensive oil development in this region and the construction of TAPS. The following provides a synopsis of the history of development in the NPR-A region, the Prudhoe Bay region between NPR-A and ANWR, and TAPS. These sections are followed by a synopsis of the *Exxon Valdez* oil spill.

D.2 Historical Synopsis: NPR-A

As described by the Bureau of Land Management (BLM and MMS, 1998), assessment of NPR-A proceeded in four distinct periods of administration and exploration. These include an early period (pre-1923), the Navy period (1923-76), the Department of Interior period (1976-80), and the private period from 1981 to the present (BLM and MMS, 1998).

The first period begins with Native peoples' use of oil seeps and ends with establishment of PET-4 in 1923. While there are no physical traces of local use of the oil seeps, this use is documented by oral traditions describing the harvest of hardened petroleum or "pitch" from oil seeps. This use continued through at least the 1930s. For example, Libbey (1988-89, p. 524) includes an oral account from a Barrow resident following the introduction of the metal stove for heating and cooking:

> And later on, back in the 1930s, they started to let people go out to the pitch lake out here at Tulimaniq (Barrow TLUI Site #140) and cut up those in blocks and put it in gunny sacks and haul it down to the beach for the Native Store . . . it is the seepage of the oil that surfaces and spreads out. As time goes by it hardens. So they cut it in blocks before the snow goes away.

BLM and MMS (1998) note that the local population required the use of fuels beyond marine mammal oils and driftwood for at least the last 100 years. Pitch was one source of these ancillary fuels.

Before the Minerals Leasing Act of 1920, numerous oil and gas claims were located in what is now NPR-A (BLM and MMS, 1998). Roughly 117 claims were staked before establishment of the reserve. The prospecting permits for these claims were issued by the General Land Office, which became the BLM in 1946. The permits expired 10 years from approval, and no records exist of any exploration under these claims (BLM and MMS, 1998).

The Navy began oil and gas exploration in the reserve in 1944 and conducted extensive exploration between 1944 and 1952 (Selkregg, 1975; BLM and MMS, 1998). The first exploration wells were drilled near oil seeps and on surface anticlines. The approach was simple. A site was prepared, a drill rig erected and drilling commenced. After drilling, the sites were simply abandoned with little or no cleanup. The bulk of material left behind at these early exploration sites was not cleaned up until 1976, when USGS was appointed responsible party for exploration operations in the reserve under Section 104 of the Naval Petroleum Reserves Production Act of 1976 (NPRPA). While most of these abandoned sites today consist of a pipe surrounded by natural vegetation, a number remain in need of maintenance or completion — e.g., reclamation, abandonment, plugging, or other tasks (BLM and MMS, 1998).

The Navy period of exploration resulted in several oil and gas discoveries. Umiat was the first oil field discovered in northern Alaska (1946), although it remains undeveloped. The South Barrow gas field, the first significant gas discovery (1949) on the North Slope, was developed by the federal government in 1958 to supply fuel to Barrow.

By the mid-1970s, the Navy's dependence on and need for oil were dwarfed by that of the entire nation's economy as particularly affected by the oil embargo of 1973. The need to increase domestic oil production was accompanied by a rising environmental consciousness and interest in the variety and richness of wildlife in the NPR-A region still known as PET-4. In 1976, President Gerald Ford signed the NPRPA calling for development of PET-4 and other Naval reserves. This law transferred management of PET-4 to the Secretary of Interior and renamed it as NPR-A.

The Department of Interior, specifically USGS, was charged with exploring NPR-A between 1976 and 1982 under Section 104 of the NPRPA. USGS contracted for exploration with Husky Oil Company. BLM and MMS (1998) note that the wellsites built during this period generally were composed of a camp pad, drilling pad (normally all one pad), reserve/mud pit, a flare pit, a fuel-storage pit, and a wellhead consisting of a pipe (Christmas tree) surrounded by the cellar (corrugated metal chamber or timber cribbing). Although most wellsites were serviced by ice airstrips, three included gravel airstrips. Drilling operations in areas of unknown underground pressures sometimes used pits to allow for a safe way to redirect escaping petroleum. In addition, the pits received expended drilling muds.

This phase of NPR-A exploration resulted in 28 exploration wells and some 14,800 miles of seismic data. Numerous oil and gas shows were reported, but no commercial fields were discovered. Gas fields near Barrow (Barrow

and Walakpa) were developed through government subsidies and produced for local use. USGS/Husky exploration ended in 1981. The USGS began continuous wellsite cleanup and rehabilitation in 1978. Solid wastes were disposed at the solid-waste-disposal site at Lonely.

Today, the 28 abandoned wells remain under USGS jurisdiction. All of these wells were the subject of an intensive revegetation program. Since then, the sites continue to be reclaimed naturally by local species. Those sites with compacted gravel pads have taken considerably longer to show signs of natural vegetation takeover than the soil-based pads. The USGS wells have deep permanent plugs generally at about 2,000 ft; in addition, all zones of petroleum fluids or pressure are isolated by permanent plugs. At the surface, the wells have Christmas tree valve (abandonment head) assemblies. This allows a small valve to be opened for temperature logging as part of an ongoing program of climate research.

The private exploration period of the NPR-A began with the passage of the Interior Appropriations Act of December 1980. An oil and gas leasing program was initiated by the Department of the Interior, and the first sale was held in 1982. One well, ARCO's Brontosaurus No. 1, was drilled in 1985 and abandoned in the same year as a dry hole. The Cape Halkett land exchange transferred an existing W.T. Foran well to the Arctic Slope Regional Corporation (ASRC) and allowed ASRC to drill the Livehorse well on private land in NPR-A. Wells in the Barrow area (such as the South Barrow Gas field and the Walakpa exploration wells) that had been developed by the federal government were passed to the North Slope Borough through the Barrow Gas Field Transfer Act. The Walakpa (Ualiqpaa) field now produces more than 90 percent of Barrow's annual consumption of natural gas (NSB, 1998).

A recent EIS (BLM and MMS, 1998) details present-day development requirements for the northeast part of NPR-A now being leased for private development. The leasing plan protects habitats judged important to molting geese and the Teshekpuk Lake caribou herd by making theses areas unavailable for leasing or by strict restrictions on oil and gas surface occupancy. Additionally, surface-use restrictions and other stipulations were applied to other habitats identified as having high surface-resource values, including subsistence use areas, areas along rivers used by raptors for nesting, and "special areas" along rivers. Protection of these areas left some 87 percent of the planning area available for leasing. Leasing stipulations required consultation with affected communities, establishment of a subsistence advisory committee, and creation of an interagency research and monitoring team. This team would coordinate research and monitoring studies related to the effectiveness of stipulations and surface resource impacts. Other than temporary ice roads, no roads connecting outside the planning area are allowed.

Well designs and seismic techniques have evolved since the early days of government exploration in the NPR-A. Modern well designs generally call for recirculating mud systems without pits. The disturbed area is minimal. Modern completed wells under any future leasing should resemble Brontosaurus: a closed pipe marks the location and little else is visible; the ground area has a natural appearance. Seismic exploration programs now use vibrating equipment rather than explosives and benefit from the considerable experience of early government programs.

The acceleration of petroleum exploration in NPR-A between 1944 to 1953 accelerated the cash economy of the Arctic. Additionally, this program led to establishment of the Naval Arctic Research Laboratory (NARL) in 1947 which added employment and resulted in a long-term federal commitment to a quest for knowledge of the arctic region, its people, land, water, resources, and climate. Scientists based at NARL initiated studies of disturbance on soils and nutrient cycling (Shaver, 1996). The NARL facility provided research and logistic assistance to virtually all arctic research programs conducted through the mid-1980s. The facility remains today, but has been transferred to and is operated under the auspices of the North Slope Borough.

The presence of NARL facilitated research in the northwestern Alaska arctic region within and beyond the borders of the NPR-A. Truett (2000) notes that in 1958, the U.S. Atomic Energy Commission authorized environmental studies on the northwestern coast of Alaska in anticipation of an experimental harbor excavation by nuclear blast (which never materialized) (Wilimovsky and Wolf, 1966). In the early 1970s, the National Science Foundation initiated two arctic Alaska programs: (1) the International Biological Program and its Coastal Tundra Biome studies at Barrow (Brown et al., 1980), and (2) the Research on Arctic Tundra program inland from Barrow at Atkasook (Batzli and Brown, 1976). In 1975, the U.S. government started the oil-related Alaska marine-studies program known as the Outer Continental Shelf Environmental Assessment Program, described by its director as "the largest environmental program in the history of our nation and probably of the world" (Engelmann, 1976). This program received logistical and other support from NARL. Also, between 1976 and 1979, the USGS conducted environmental studies in NPR-A in anticipation of potential oil development there following their mandate to explore the region. The NPR-A region

has a long history of scientific research. The NPR-A EIS (BLM and MMS, 1998) contains a comprehensive description of the environment, wildlife resources, subsistence use patterns, human resources, etc. of NPR-A.

D.3 Historical Synopsis: Prudhoe Bay Oil Fields

In 1964, the State of Alaska, largely on the basis of geological surveys, selected a 200-km coastal stretch between NPR-A to the west and ANWR to the east. That same year, competitive lease sales were conducted in the Colville River delta and around Prudhoe Bay (Gilders and Cronin, 2000). Ten dry holes were drilled in the region between 1964 and 1967 — five in 1964, one in 1965, two in 1966, and two in 1967 (Selkregg, 1975). Many oil companies gave up hope of finding commercially viable petroleum deposits on the North Slope. However, Atlantic Richfield Company (ARCO) and Humble Oil and Refining Company (now Exxon Company, USA) announced a major oil strike on March 13, 1968 (Gilders and Cronin, 2000). Ultimately, the total reserves of this strike were estimated at 23 billion barrels of oil and 26 trillion cubic feet of natural gas. Field development began in 1969.

This discovery brought force and economic urgency to settle Native protests and claims regarding federal land set-asides and state-selected lands. The then North Slope Native Association, for example, had claimed virtually all lands north of the 68th parallel. These claims were based on the Omnibus Act of June 26, 1959, which amended the Statehood Act to include "that Alaska and its people disclaim any right to land and property held by Alaska Natives or held in trust by the United States for such Natives." The implications were staggering. Leasing of state lands was suspended by the Secretary of the Interior in November 1966, one month following the state announcement of the opening of large blocks of additional land to oil and gas leasing, and the subsequent Native protests.

Compromise legislation was finally initiated in the form of ANCSA in 1971. President Lyndon B. Johnson had set the framework for the legislation by recommending in 1968 that Congress (1) "give the Native people of Alaska title to the lands they occupy and need to sustain their villages"; (2) give them rights to use additional lands and water for hunting, trapping and fishing to maintain their traditional way of life, if they so choose"; and (3) "award them compensation commensurate with the value of any lands taken from them" (Selkregg, 1975). This act provided the basis for the establishment of the North Slope Borough (NSB) as the local government entity for the entire arctic region, and assured economic vitality of Native communities through monetary compensation and land selection rights. With this action, the Iñupiat of the Arctic moved into a new era of self-assertion and a new cultural, political and economic identity (Selkregg, 1975). Oil-field development in the Prudhoe Bay region was free to proceed on land beyond that which had been leased before the 1966 land freeze. Further, ANCSA enabled development of TAPS.

Gilders and Cronin (2000) list eight producing and four planned oil fields in the Prudhoe Bay region as of 1998 and note that these refer to both "units" and "participating areas". They also note that there were six additional participating areas on the North Slope whose oil is processed by existing facilities (i.e., no additional surface impact). A "unit" is a combination of existing oil and gas leases that, by agreement among the lessees of record and the lessor (State of Alaska in the Prudhoe Bay region fields developed to date), is combined into one lease (or unit) to promote optimal development of the oil and gas resource.

The distribution of producing units presently operating on the North Slope is shown by Figure D-2. The Prudhoe Bay Unit was the first oil-producing area on the North Slope, discovered in 1968. This unit essentially began production as soon as TAPS was opened in 1977. Recent developments in this unit include the Lisburne, Point McIntyre, and Niakuk oil fields which began production in 1986, 1993, and 1994, respectively.

The Kuparuk River Unit, the second oil-producing area in the region, began production in 1981. Production from the Milne Point Unit followed in 1985, establishing it as the third major oil field in the region. Production from this unit was suspended in early 1987 due to unfavorable oil prices, but the unit resumed production in 1989. A seawater treatment plant and waterflooding facility along with a 700-ft dock were established at Oliktok Point in 1985 to support these and potentially other units (e.g., Alpine).

Endicott was the fourth producing oil field on the North Slope, beginning production in 1987 (Gilders and Cronin, 2000). It was notable, however, in that it was the first offshore production facility in the North American Arctic. Built in the winter of 1984-85, Endicott's two artificial islands were connected by a curved, 3.7-mile-long gravel fill causeway, and this segment is connected to shore by a 1.6-mile-long causeway originally constructed with two breaches for fish passage. These breaches provided a total opening of about 630 ft.

The Badami and Alpine oil fields are the most recent developments, beginning production in 1998 and 1999, respectively. These developments reflect the most modern

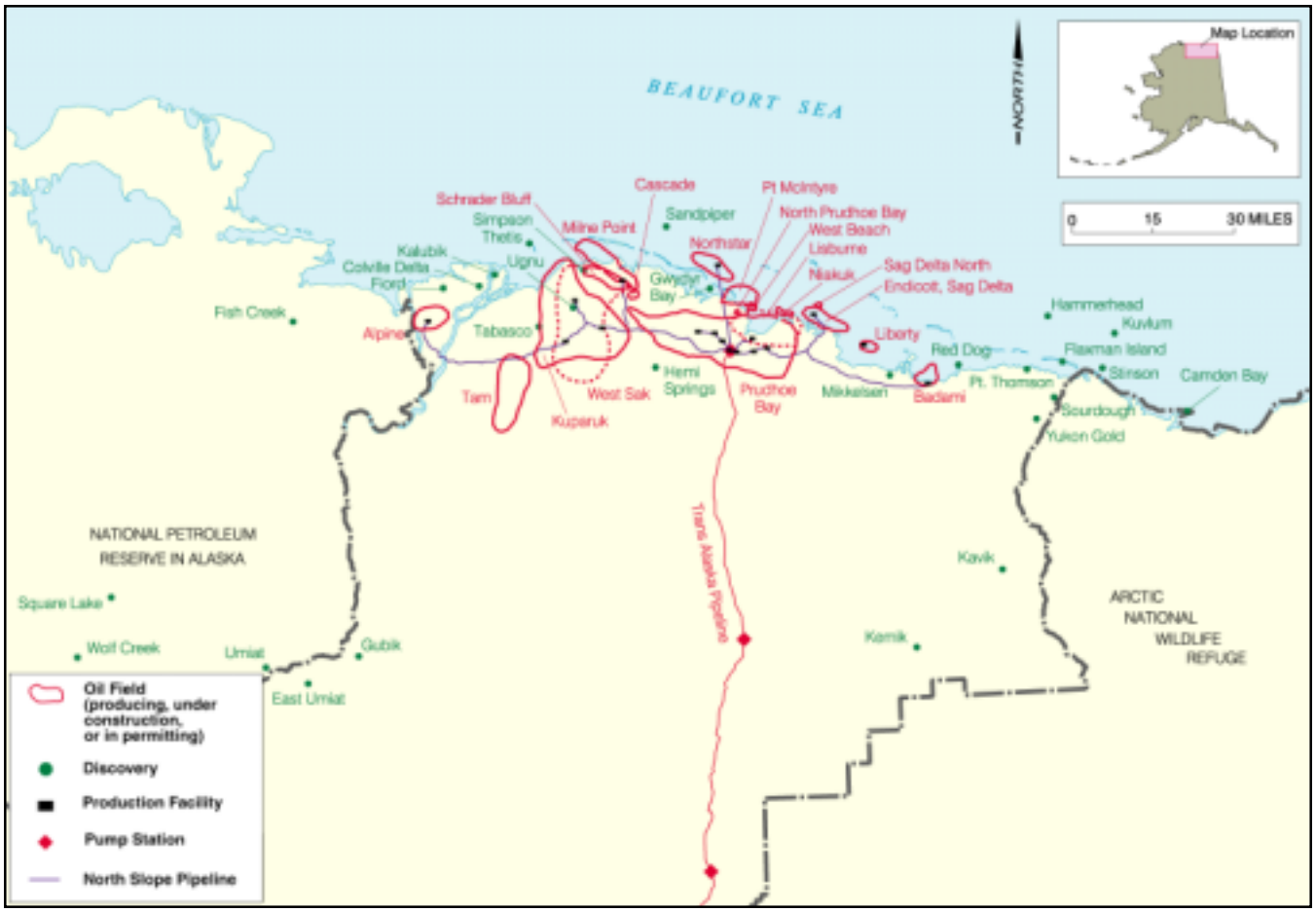

Figure D-2. *Alaska North Slope oil fields.*

technology and are "roadless." Collectively, the oil fields of the Prudhoe Bay region were, and still are, the largest oil and natural gas discoveries in the history of North American exploration. Alaska North Slope oil provides 20 to 25 percent of U.S. oil production, and approximately 85 percent of the Alaskan state budget is derived from taxes and royalties collected on oil production (Gilders and Cronin, 2000).

Disturbances from early oil and gas exploration and development included tracks in the tundra from vehicles during summer, temporary peat roads bulldozed in tundra in both summer and winter (Reed, 1958), and drill sites (Lawson et al., 1978; Ebersole, 1987). The greatest environmental effect of these disturbances was ground subsidence caused by the permafrost thawing ("thermokarst" effect). Many of these thermokarst impacts can be seen even today, and the lessons learned have been applied to modern practices.

Gravel fill has been the solution to the thermokarst problems in the Prudhoe Bay region. It is used to support facilities and vehicular traffic on tundra, providing a dry, stable surface that can be safely used year-round (Gilders and Cronin, 2000). Moreover, gravel fill prevents heat transfer from facilities to the tundra, thus preventing thermokarst and subsidence (Hanley et al., 1981). In the Prudhoe Bay area, gravel is mined from local sources, and most pads and roads are constructed to a height of 5 ft (Walker et al., 1987). The pads, roads, and gravel mine pits provide an infrastructure "footprint" on the moist tundra that can be quantified from aerial photography in terms of acres of fill or gravel mine pits.

Powerlines and pipelines do not presently require gravel pads. Pipelines are typically constructed from ice roads during winter, with a 400-ft or more separation from any adjacent roads. They are usually elevated 5 ft or more above the ground on vertical support members (VSMs) to allow wildlife to freely pass. VSMs produce minimal disturbance to the tundra. Inspections are conducted using aircraft during summer and from ice roads or aircraft during winter. In other cases, pipelines are buried in the roads, and some of the older lines are on gravel pads.

The following describes the incremental development of the Prudhoe Bay oil field from 1968 to 1999. Gravel fill and mine areas measured in acres and miles of common

carrier pipelines are used to quantify the rate and amount of oil field expansion. The areas of disturbance and miles of pipelines are based on the calculations of Ambrosius (2000) from existing photography that is adequate for this purpose — namely, photography from 1968, 1973, 1983, 1990, and 1999. These estimates constitute the most accurate totals to date. It should be noted that these areas have been calculated on a unit or oil field basis, but include all these as well as all private and public facilities except for military installations. These facilities would not exist without the oil field and are thus considered part of the overall development. Lastly, note that the TAPS ROW and the Dalton Highway are largely excluded, except for the areas in the oil field region per se. These will be addressed in the following section dealing specifically with TAPS.

In 1968, some 72 acres of tundra in the Prudhoe Bay region exhibited a disturbance or development footprint (Figure D-3). These consisted of the ARCO base camp (including a small landing strip), a peat road extending from the base camp to the discovery site, and the drill site located about 5 km southwest of the Prudhoe Bay shoreline. By 1973, extensive development had occurred in the region, and exploration footprints or tundra disturbance were evident in the discovery area, as well as to the west in the region between Milne and Oliktok Points and to the east in what is now known as the Badami and Point Thomson areas (Figure D-4). Production facilities and pipelines, camps, oil-field service company installations, docks to receive summer barge traffic, a large main and satellite airports, and an industrial highway linking this remote region to Fairbanks had all been constructed by 1973. As late as 1967, this region had been open tundra with scattered Iñupiat seasonal hunting and fishing camps (Parametrix, 1997). The cumulative size of the footprint in 1973 had increased to some 2,445 acres. Peat roads were still prevalent and in use, as well as gravel fill roads and mine sites.

Much of the development during the initial development period and subsequent eras was supplied by "sealift." Heavy equipment and development modules (complete in every detail) constructed in the contiguous 48 states were and are loaded on oceangoing barges and transported to the North Slope. Marine shipments are limited to seasonal windows between late July and early September when the arctic coast is "ice-free." East Dock, constructed to receive these oceangoing barges, was the only offshore development evident in 1973. It had been constructed in 1969 on the southeast shoreline of the Prudhoe Bay. The dock consisted of a 1,100-ft-long gravel-fill causeway terminating in a 100-by-200-ft wharf constructed from barges grounded in about 4 ft of water (USACE, 1984; Colonell, 1990). Selkregg (1975) provides photographs of this dock and associated storage yard, noting that "the greatest freight

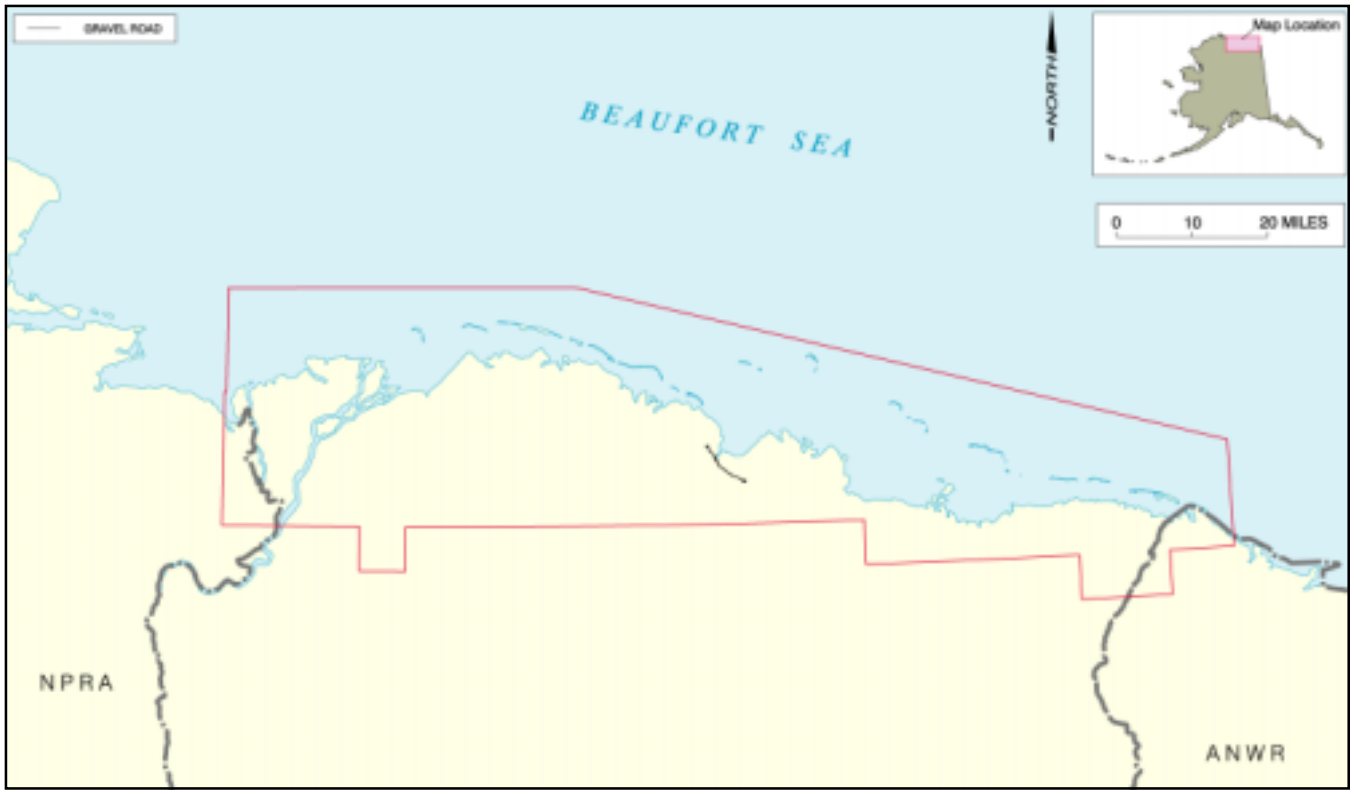

Figure D-3. *Alaska North Slope oil field development footprint in 1968.*

movements in the history of the Arctic passed over this dock."

The largest increment of footprint expansion in the Prudhoe Bay region occurred between 1973 and 1983 (compare Figures D-4 and D-5). The footprint increased from 2,448 acres in 1973 to 8,115 acres in 1985. TAPS, approved in 1973 and built between 1974 and 1977, became operational with the June 20, 1977 delivery of Prudhoe Bay oil to tankers in Valdez (Gilders and Cronin, 2000). Offshore development had increased by 1983 to include artificial gravel islands for exploratory drilling, and West Dock. This dock is located on the northern perimeter or the west side of the bay and effectively replaced East Dock as the main docking facility. This structure has had a most contentious history and was the focal point of offshore development or "causeway" issues for many years.

The structure was originally constructed in the winter of 1974-75 to serve as an alternative to East Dock (Colonell and Gallaway, 1990). The original structure extended about 3,600 ft from the northwest shore of Prudhoe Bay and terminated at Dockhead 2. In the late summer of 1975, the first year of the operation of this new dock, supply barges became trapped in the ice about 4,800 ft offshore of Dockhead 2. Emergency permits were granted to extend the dock to the barges, and this was accomplished in early 1976. Dockhead 3 was established in about 6 to 7 ft of water and was now over 1.5 miles from the shoreline.

The Dockhead 3 extension marked the emergence of pronounced concerns by regulatory resource agencies over potential impacts of solid-fill docks or causeways on coastal and marine resources of the Alaskan Beaufort Sea. The term "causeway" has since been applied to any solid-fill gravel structure that extends from land into the coastal waters of the Beaufort Sea to provide landing facilities for marine-borne cargo, access to gravel island production facilities, shelter and support for seawater intake and treatment plants, safe pipeline routes, etc. Although several studies to assess the impacts of the emergency extension of West Dock were initiated, the results were deemed inconclusive by the regulatory community because agency scientists did not believe the issues of interest had been clearly addressed (Meehan, 1980).

In 1979, another extension of West Dock was proposed for the purpose of waterflooding (a secondary oil recovery process) the Prudhoe Bay oil field. It was proposed that West Dock be extended 4,560 ft due north from Dockhead 3 out to a water depth of 12 ft. A seawater intake and treatment plant were to be installed at the seaward tip of this extension. The third leg of West Dock, known as the Waterflood Extension, was constructed for this purpose in sum-

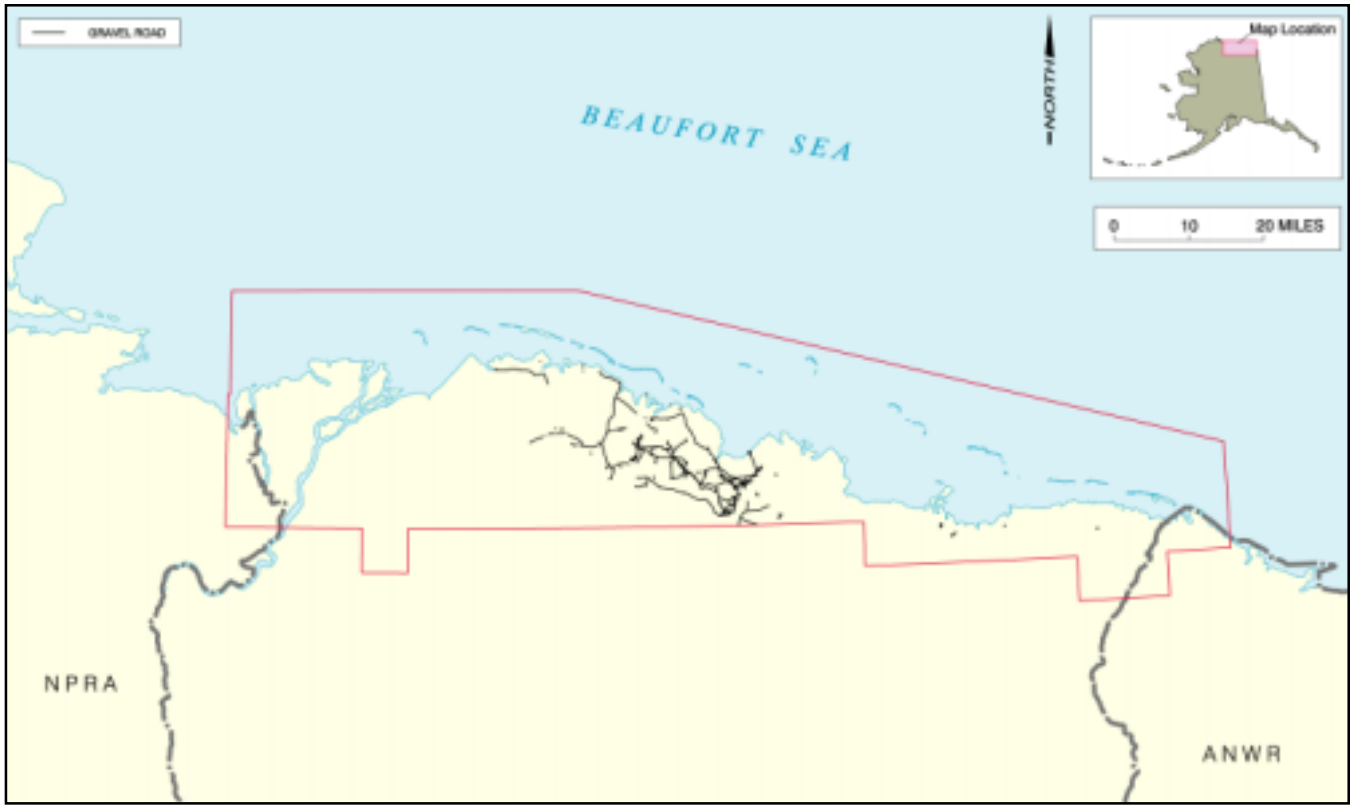

Figure D-4. *Alaska North Slope oil field development footprint in 1973.*

mer 1981, extending the total length of the structure to about 2.5 miles. This leg is connected to the original structure just north of Dockhead 3 by a bridge that spans a 15.8-m-wide breach installed as a passage for fish and small boats. To accommodate additional piping and access requirements, the causeway was enlarged over its entire length to provide a 12-m-wide roadway 5.5 m above mean sea level.

The Waterflood Extension heightened regulatory agency concerns about the impacts of West Dock on the marine environment and resources. The permit stipulated that a comprehensive monitoring program be conducted, called the Waterflood Monitoring Program or Waterflood Studies. Both the terrestrial and marine components of the program were conducted annually from 1981 to 1984. Extensive field studies of oceanographic conditions and anadromous fish use of the coastal zone in the vicinity of West Dock and the Prudhoe Bay region were done under the auspices of the U.S. Army Corps of Engineers (USACE). The goals were to evaluate the predictions that had been made in the project's EIS (USACE, 1980) and establish the actual effects. Colonell and Gallaway (1990) assessed the effects of this structure based on these studies.

Although the North Slope was building a strong tradition of exploration success both onshore and offshore in the late 1970s and early 1980s, it is an interesting historical note that the most spectacular failure in the history of petroleum exploration in Alaska also occurred offshore of the North Slope in 1983. The Mukluk Prospect offshore of the Colville River delta leased in 1982 for total high bids exceeding $1.5 billion, with the highest single bid being $227 million for one outer-continental-shelf tract. The Mukluk well was drilled in 1983 at a cost of $120 million, but then plugged and abandoned as a dry hole. It remains to this day the most expensive dry hole ever drilled (BLM and MMS, 1998).

Analysis of the 1990 photography reflected a total footprint of 10,146 acres, an increase of 2,031 acres from 1983 (Figure D-6). The most notable areas of increased development onshore occurred in the Kuparuk area. Offshore, Endicott is present, having been constructed in the winter of 1984-85. Endicott, like West Dock, was associated with large terrestrial and regional-scale marine monitoring programs. This study effectively replaced the Waterflood

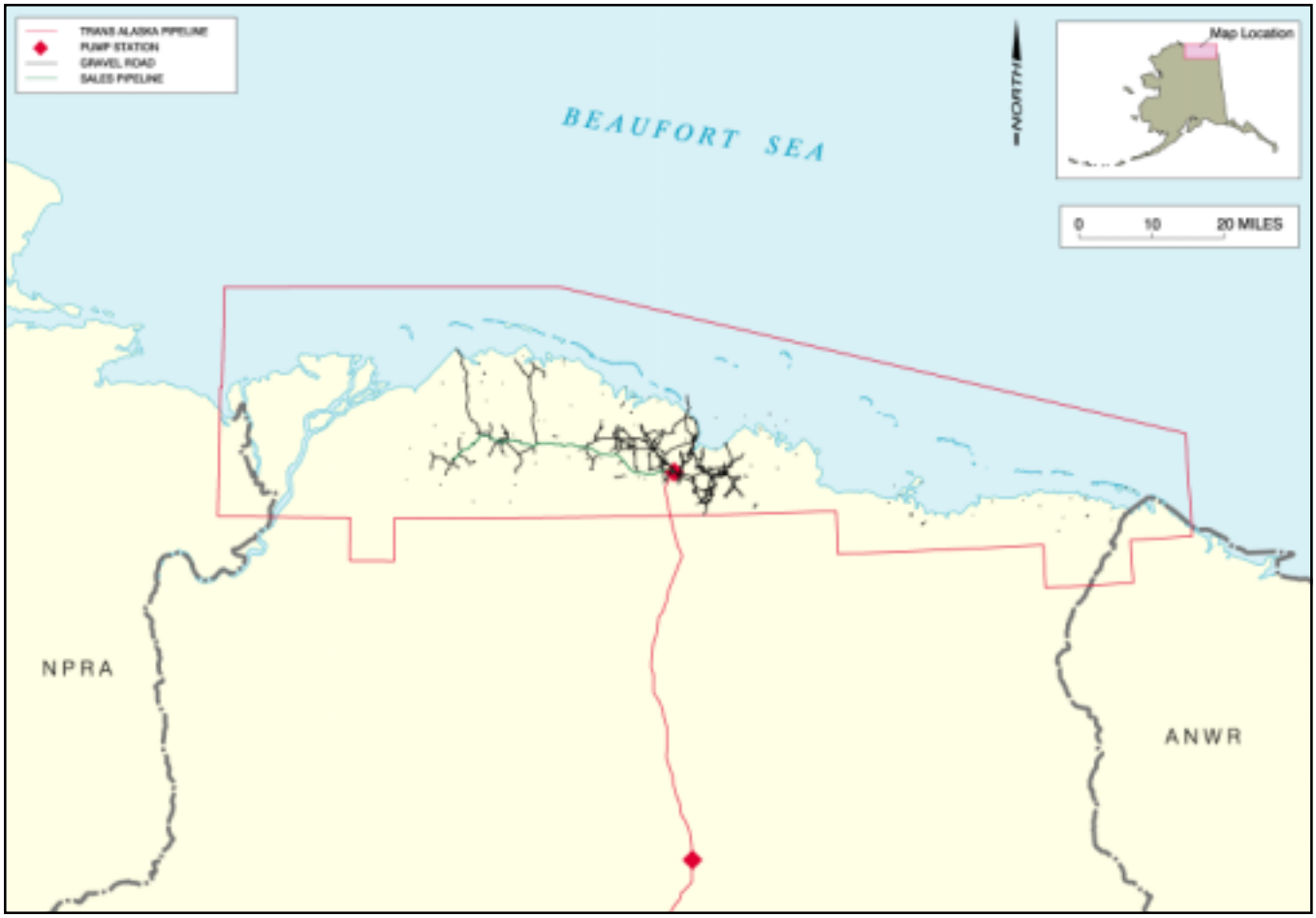

Figure D-5. *Alaska North Slope oil field development footprint in 1983.*

Monitoring Program but included the historical monitoring sites around West Dock along with new sites at Endicott. The oceanography and fish studies were conducted under the auspices of the USACE during 1985 to 1987; the marine studies also included monitoring the Boulder Patch kelp community during 1984 to 1991 for the Environmental Protection Agency (Martin and Gallaway, 1994).

Based on results of the 1985 to 1987 fish and oceanographic studies at Endicott (Hachmeister et al., 1991), the USACE determined in early 1988 that additional breaching of the causeway was required to mitigate perceived adverse effects on broad whitefish habitats and populations. This view was not accepted by the NSB and industry, and a new fish and oceanographic monitoring program was initiated (see Wilson and Gallaway, 1997 for a review). This program ran from 1988 through 1997. Additional breaching for the causeway was rejected as an option until 1991.

The agreement by industry to add 600 ft of breaching in the Endicott Causeway in the winter of 1993-94 as well as 600 ft of breaching at the base of West Dock in the winter of 1995-1996, was a negotiated settlement associated with the development of the Pt. McIntyre oil field drilled from West Dock. Consensus was never truly reached between regulatory agencies and industry on the effects of causeways and the need for beaching in these structures. However, there presently exists a wealth of published scientific information (over 40 articles) regarding these issues for the two causeways, and consensus is slowly emerging. There appears to have been good cause for additional breaching at the base of West Dock, but the additional breaching of Endicott was probably unwarranted (Fechhelm et al., 1999; Fechhelm, 1999).

The development footprint in 1999 was 10,653 acres, only about 500 acres larger than the 1990 footprint (compare Figure D-7 to D-6). The Badami and Alpine developments were the major new oil fields that had been or were near completion in 1999 as compared to 1990. Each was characterized by less than 200 acres in total footprint (184 and 140 acres, respectively), reflecting modern development methods as will be described below. By 1999, there were also some 241 miles of common carrier pipeline (Figure D-7), which had increased from 43 miles in 1983, and 114 miles in 1990.

Since development of the Prudhoe Bay oil field, meth-

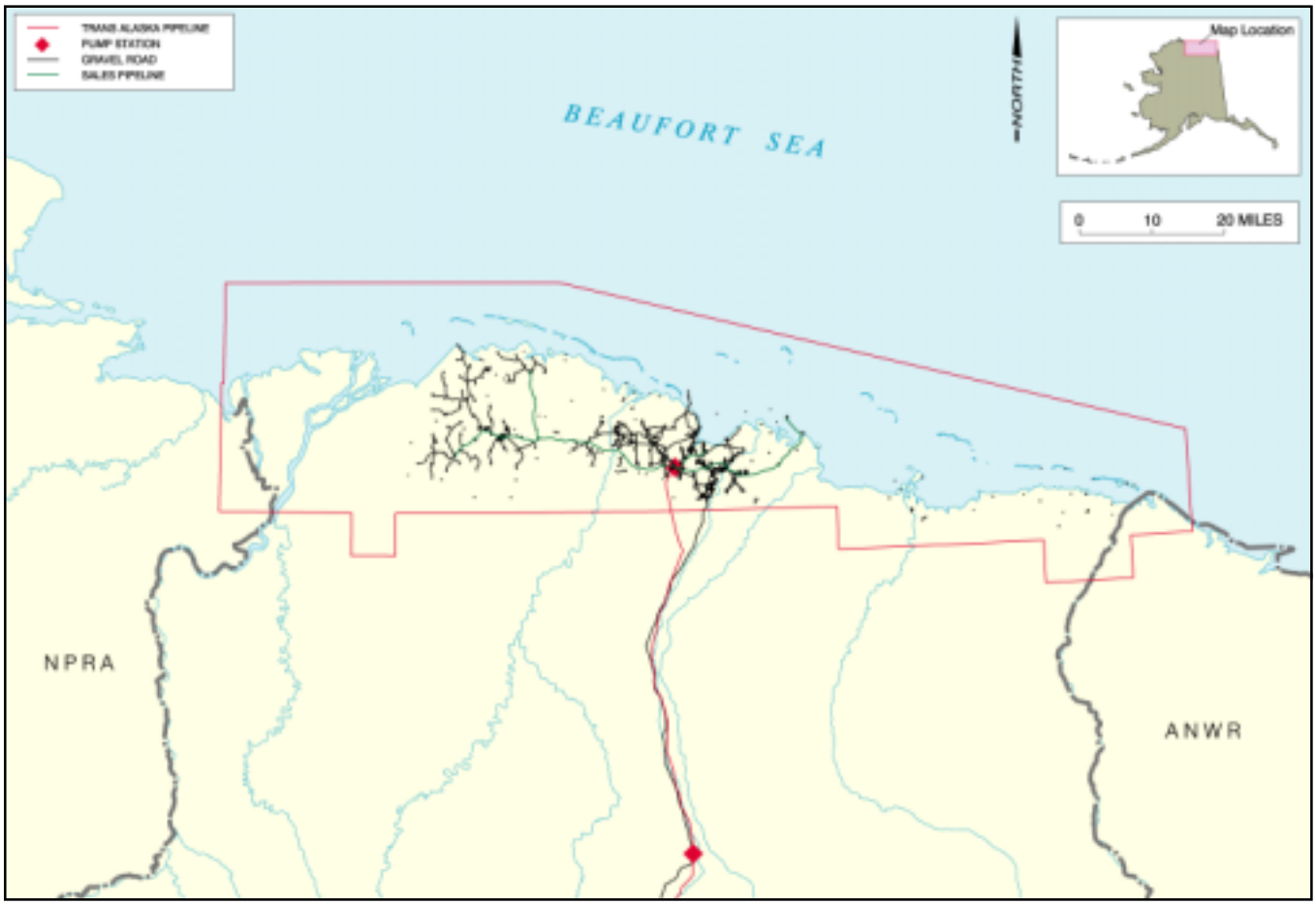

Figure D-6. *Alaska North Slope development footprint in 1990.*

ods of mitigating environmental impacts have focused on reducing the size of oil industry operations. The greatest reduction in the operational footprint has been achieved through the following methods (Gilders and Cronin, 2000):

- Consolidation of facilities.
- Use of ice roads to eliminate gravel roads next to pipelines, and elevating the pipelines 1.5 m above the tundra to allow free movement of wildlife.
- Directional drilling to reduce the number of gravel pads.
- Improved waste handling and the elimination of reserve pits for surface storage of drilling muds and cuttings (these drilling by-products are now reinjected into confining geological formations).

As detailed by Gilders and Cronin (2000), mitigation efforts have minimized changes to the environment that occur during an oil field development; this becomes apparent when past oil field developments are compared with new operations, as in the following examples for selected oil fields. Gravel fill in the Prudhoe Bay oil field directly covers 6,405 acres, or approximately 2.62 percent of the operating unit of 244,787 acres. It has been estimated that if the oil field was developed today, gravel would cover only 1,524 acres, or approximately 0.62 percent of the operating unit. Additionally, the Deadhorse service area (which covers approximately 746 acres of the oil field) would not exist; contractor facilities would be consolidated with oil company facilities, as they have been at the Kuparuk oil field. New field developments show a relatively high level of facility consolidation and technological advances that minimize surface coverage. The facilities servicing the Badami oil field, for example, cover approximately 183 acres (0.49 percent) of its 36,945-acre unit, and the Alpine oil field covers some 140 acres (0.17 percent) within its 80,464-acre unit.

Directional drilling technology permits drilling from a single well pad to reach locations up to 3 miles laterally from the drillsite. Other advances in drilling technology allow wells to be drilled as close together as 9 ft (compared to over 130 ft two decades ago), further reducing the size of the gravel pad needed to access a reservoir. Increased automation and remote-controlled operations have reduced the need for surface connections to all sites, thus eliminating some roads; and pipelines now routinely are built in

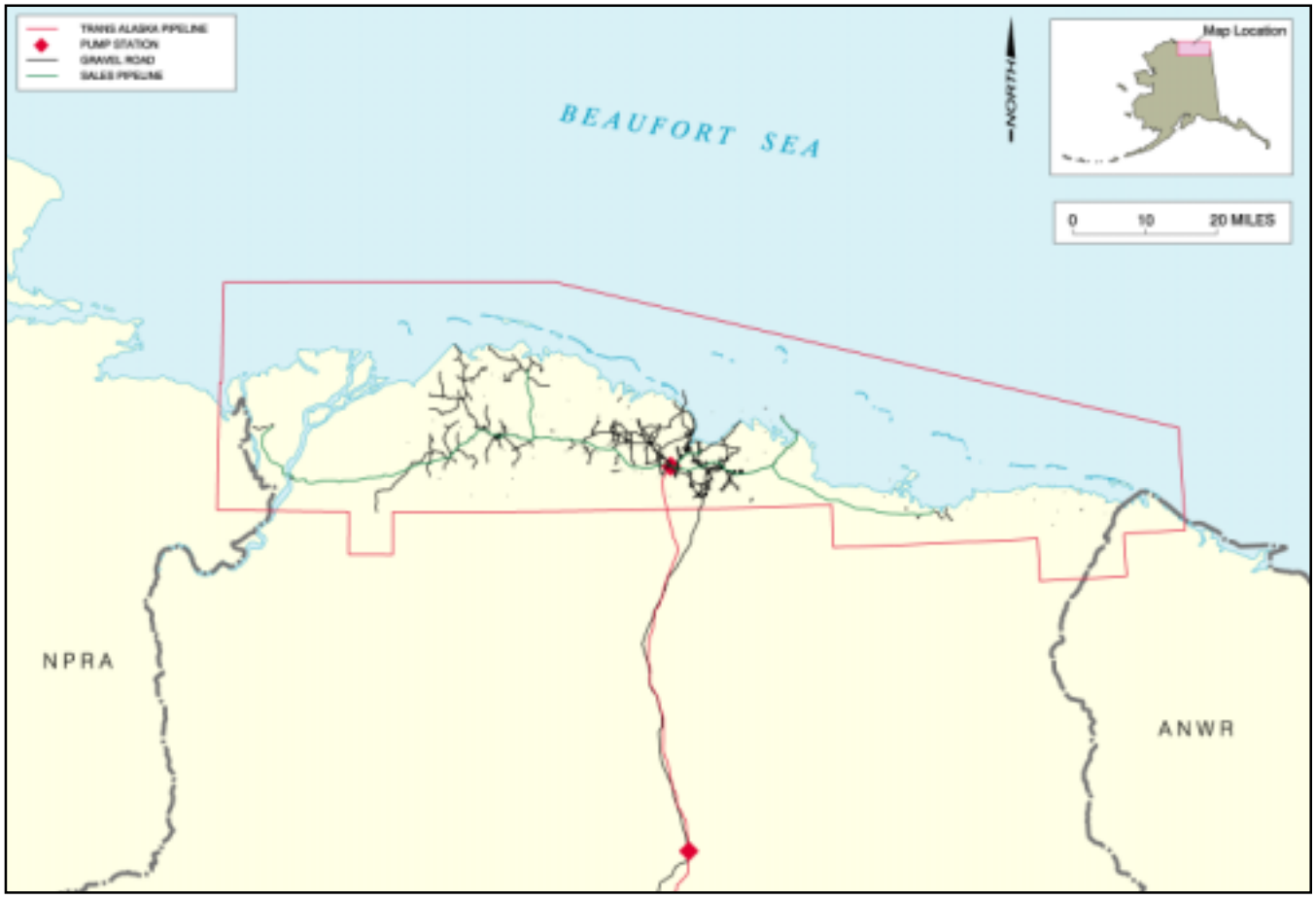

Figure D-7. *Alaska North Slope oil field development footprint in 1999.*

Table D-1. *Average rate of increase in ANS oil field development footprint, 1968-99.*

Oil Field	1968	1973	1983	1993	1999
Prudhoe Bay	72.4	2,322.3	6,093.1	6,367.1	6,406.1
Kuparuk	0.0	10.0	1,557.9	2,476.4	2,554.4
Milne Point	0.0	43.0	204.9	357.4	449.6
Lisburne	0.0	0.0	0.0	248.9	248.9
Endicott	0.0	0.0	74.1	511.6	511.6
Pt. McIntyre	0.0	0.0	0.0	0.0	31.3
Niakuk	0.0	0.0	0.0	0.0	24.3
Badami	0.0	58.3	80.9	80.9	183.8
Pt. Thomson	0.0	14.3	103.7	103.7	103.7
Alpine	0.0	0.0	0.0	0.0	139.5
Total in Acres	72.4	2,447.9	8,114.6	10,145.9	10,653.2

winter from ice roads and surveyed by air, eliminating additional roads and the associated tundra coverage (BP and ARCO, 1997).

Gilders and Cronin (2000) demonstrate the dramatic size difference between "A" Pad built in the 1970's and "P" Pad built in 1990. "P" Pad is 70 percent smaller than its predecessor. The assertions of Gilders and Cronin (2000) regarding mitigation are supported by the average rate of increase in the oil field footprint characteristic of 1968 to 1973, 1973 to 1983, 1983 to 1990, and 1990 to 1999 (Table D-1). Footprint expansion per year peaked at 567 acres per year between 1973 and 1983, but between 1990 and 1999, the rate of expansion declined by an order of magnitude (56 acres per year). As more fields reach the end of production and the footprint areas are reclaimed, a reversal in rate will occur. Given the minimal footprints associated with new developments, the rate of footprint decline will likely be much steeper than the historical rate of increase in footprint area.

Scientific studies accompany virtually every phase of North Slope oil-field operations, as shown in Table D-2 (Gilders and Cronin, 2000). In these oil fields, oil industry and regulatory agency researchers have conducted studies on a variety of species, habitat types, and other topics, including caribou, arctic foxes, brown bears, polar bears, fish and the marine ecosystem, Spectacled Eiders, Common Eiders, Black Brant, Snow Geese, Tundra Swans, shorebirds, wildlife use of disturbed sites (impoundments, gravel pads, peat roads), and the revegetation of abandoned gravel pads (see Truett and Johnson, 2000, for a thorough review).

Environmental studies conducted over the past three decades have provided direct input into the design of new oil fields. They have resulted in long-term data sets (in many cases collected over a decade or more) on such topics as fish, Snow Geese, shorebirds, Black Brant, caribou, and revegetation programs; these permit the establishment of science-based standards for operations. Such studies also help to quantify the level of environmental change that has occurred because of oil development.

Table D-2. *Scientific studies during ANS oil-field development phases.*

Development Phase	Focus of Environmental Studies
Exploration	Baseline studies: habitat and wildlife distribution
Preconstruction	Environmental assessment
	Identification of sensitive seasons and/or habitats
Construction	Avoidance of sensitive seasons and/or habitats
Postconstruction	Monitoring for potential impacts and disturbance
Postabandonment	Site assessment
	Rehabilitation: revegetation, creation of useful wildlife habitat

As detailed in Truett and Johnson (2000) environmental programs conducted in the oil fields have demonstrated that fish and wildlife populations in the oil fields continue to rise and fall in response to naturally occurring pressures (such as predation and climate); in some cases they also respond to anthropogenic disturbance associated with development activities. Both birds and mammals have been documented using industry-disturbed sites (for example, loons and other waterfowl in impoundments, caribou on gravel pads and roads, Common Eiders on gravel causeways and islands, and shorebirds on abandoned peat roads). Arctic foxes frequently have been observed denning in and

around structures at oil field facilities, raising concerns that their numbers may be elevated in the oil fields because of readily available alternative food supplies and the presence of suitable denning sites in industrial facilities, although other naturally occurring factors may also be involved. Environmental-awareness training in the oil fields has focused on reducing the amount of food that foxes may obtain from field personnel (either by direct feeding or access to vehicles and dumpsters); artificial den sites also have been modified to prevent use by foxes.

In summary, new technologies involving reduced well spacing, elimination of reserve pits, directional drilling, winter maintenance and construction from ice pads and roads, aerial support, and the use of baseline and ongoing biological monitoring programs to facilitate decision-making have combined to reduce the areal impacts of development. Gravel pads can now be built 70 percent smaller than those built in the past; oil fields of considerable size can be accessed with an infrastructure much reduced from that previously required. Additionally, after more than three decades of oil development, the North Slope is one of the most intensively studied regions in North America and the best understood environment in the circumpolar Arctic.

D.3 Historical Synopsis: Trans Alaska Pipeline System

Shortly after the 1968 North Slope oil strike, a team of petroleum company engineers began to evaluate how to deliver the oil to markets. With the discovery, northern Alaska had become the energy storehouse for the nation, but only if this energy could be economically delivered to the marketplace. Virtually every conceivable approach was originally considered, including ice-breaking, double-hulled tankers, rail, tanker trucks, even under-ice transport by a fleet of submarine tankers (Gilders ,1997). Ultimately, a pipeline system was judged the only realistic alternative, and industry announced in 1969 plans to construct a pipeline from the North Slope to the year-round ice-free waters of Port of Valdez, 800 miles to the south. This transportation system (Figure D-8) ultimately became known as the

Figure D-8. *The Trans Alaska Pipeline System (TAPS).*

Trans Alaska Pipeline System. The original proposal called for an all-buried pipeline to be constructed beginning in 1970 and completed by 1972.

Gilders (1997) provides an excellent capsule of the early TAPS period. She notes that to some Alaskans, the coming pipeline was the essential link to an economically secure future and to personal opportunity, whereas to others the pipeline would be an incision that would irrevocably cut the wilderness in two, scarring it forever. Because TAPS would cross 800 miles of wildlands — most of them unprotected by specific federal legislation and many in an unresolved ownership status — the project immediately became the focus of industry, government, and special-interest groups, precipitating a period of national debate.

Gilders (1997) notes that the eventual construction of the pipeline was influenced by a remarkable sequence of landmark legislation. First, the National Environmental Policy Act of 1970 (NEPA) had a significant impact on the pipeline project. NEPA was passed on a tide of rising environmental concern, and its regulatory consequences would be far-reaching. The act required that an EIS be prepared for major activities requiring federal approval or funding, and that all reasonable alternatives be adequately studied. The act's intent was to seek a balance between protection and development and to ensure that environmental concerns were not ignored.

TAPS was the first major project reviewed under NEPA, and it was clear to all the stakeholders that regulatory precedents would be set. The result was an extended period of controversy, lawsuits, and technical reevaluations as industry and government officials alike sought a way through the unmapped territory of the new regulation.

In the year following NEPA, ANCSA created Alaska Native regional corporations and provided almost $1 billion and 44 million acres to Alaska Natives. As part of this legislation, Native land claims along the proposed pipeline right-of-way were resolved, making it possible for the federal and state governments to grant essential licenses and permits. While Congress and the regulatory agencies worked on the finer points of land claims, right-of-way restrictions, and environmental stipulations, Alyeska Pipeline Service Company was established by its owner companies as a nonprofit corporation to build, operate, and maintain the pipeline.

Through all of the delays, Alyeska's engineers continued to work on the design and specifications of the pipeline. This work was performed in coordination with experts of the USGS, the BLM, the USACE, the Alaska Department of Fish and Game (ADF&G), and other federal and state agencies. Data from pipeline field tests, simulation modeling, and an unprecedented detailed study of permafrost were slowly beginning to alter the shape of the project. Where permafrost was mapped as thaw-unstable, and in earthquake zones — both regions mainly south of the Brooks Range — plans for the buried pipeline were changing to an above-ground mode in which the pipeline would be supported on VSMs. The final EIS for TAPS was completed in 1972 (BLM, 1972).

In the meantime, the debate on the pipeline was further complicated by the emerging energy crisis of mid-1973. Under the impetus of this international development and the findings of the final FEIS, the Trans-Alaska Pipeline Authorization Act was passed by Congress and signed by President Nixon on November 16, 1973.

Early in 1974, Alyeska began moving 37,500 tons of equipment by air and truck to the Yukon River, then north by ice road. Construction of TAPS required that 73 million cubic yards of gravel be mined, stockpiled, hauled, and laid down. This meant designing and permitting hundreds of detailed gravel-mining plans. However, construction was finally underway.

Construction of the permanent Haul Road (now the Dalton Highway) was started on April 29, 1974, and completed on September 29 of that year. The first pipe was laid at the Tonsina River crossing of the Richardson Highway, 75 road miles north of Valdez, on March 27, 1975; the final pipeline weld was finished on May 31, 1977. Oil began flowing down the pipeline on June 20, 1977, and on August 1, the *ARCO Juneau* was the first tanker to leave Valdez carrying North Slope crude oil. After six years of controversy, an additional three years of construction, a workforce that ultimately totaled 70,000 people, and eight billion dollars, Alaska's oil was on its way to market.

TAPS and the Valdez Marine Terminal are described in detail in Sections 1 and 2. Some of the key attributes include that the footprint (10,432 acres or 16.3 sq. mi) of the TAPS is essentially the same as the footprint of the North Slope oil fields (10,653 acres). The 800-mi-long pipeline crosses 34 major rivers and some 800 smaller streams and three mountain ranges. The VMT covers an additional 1,000 acres including facilities for crude oil storage, ballast water treatment as well as fixed-platform and floating berths for oil tankers.

The baseline and environmental monitoring studies conducted along the pipeline by industry and agency researchers over the past 20 years have included water quality studies in Port Valdez; long-term revegetation experiments; fisheries investigations of water bodies crossed by or near the pipeline, and surveys of caribou, moose, bear, waterfowl, and other wildlife. The result is that the TAPS corri-

dor, like the North Slope oil fields, is one of the most intensively studied regions in Alaska.

Advances in engineering and construction techniques did not end when the pipeline was built. During the past 20 years, Alyeska's engineers have developed innovative advances in low-temperature engineering (Gilders, 1997). For example, a drag reducing agent (DRA) was initially injected into the pipeline at Pump Station 1 in July 1979, two years after startup. It was considered experimental at the time, and Alyeska pioneered its use to reduce drag in the oil stream. A long-chain polymer with the consistency of cold molasses, DRA dissolves in crude oil and lowers the oil's frictional resistance, increasing its flow rate through the pipeline. Use of this agent is now standard procedure.

With any steel pipe, the potential for corrosion is a significant concern (Gilders, 1997). Corrosion and stability studies are conducted along the length of the pipeline. In 1989, Alyeska began a heightened corrosion inspection program with newly developed "pigging" technology to identify problem areas. Pipeline "pigs" are mechanical devices that are passed through the oil stream — some to clean the walls of the pipeline, some to sense any deformation in the pipe, and others to detect signs of corrosion. Working with Japanese researchers, Alyeska developed the world's first ultrasonic corrosion-inspection pig. This pig measures and records the thickness of the pipeline's walls using ultrasonic transducers, identifying areas of possible corrosion before they become problems.

As Alyeska focused on its investigation of corrosion, it was an external event that soon dominated everyone's thoughts and actions. Just after midnight on Good Friday March 24, 1989, the *Exxon Valdez* strayed off course and ran aground on Bligh Reef in Prince William Sound. The ruptured supertanker spilled 240,000 barrels of oil; a total of over 10 million gallons. As the largest oil spill in North America, this event is discussed separately below.

The spill brought about changes designed to prevent future spills of this magnitude. The Ship Escort/Response Vessel System (SERVS) was established following the *Exxon Valdez* spill in response to an executive order by the Governor requiring every outbound tanker to be accompanied by two escort vessels until the tanker had left Prince William Sound. The primary goal of SERVS is to prevent oil spills; however, it also has more oil spill response equipment than any other entity in the Western Hemisphere, and it is the cornerstone of the Prince William Sound Tanker Spill Prevention and Response Plan (Gilders, 1997). With frequent drills, federal and state agencies gauge marine and shoreline response capabilities using challenging spill scenarios. Other drills are carried out along the pipeline corridor, with an emphasis on areas near rivers and streams.

As an integral part of SERVS, Alyeska has established a unique arrangement in which over 50 privately owned fishing vessels with trained personnel are on contract to provide immediate response support in case of a marine spill; several hundred additional vessels are also available to mobilize spill response equipment.

The 1989 oil spill also gave added impetus to the establishment of a coordinated regulatory body to oversee the planning, construction, operation, and maintenance of all Alaska pipelines and associated facilities. The Joint Pipeline Office (JPO) was established in 1990 and houses representatives from various federal and state agencies, including the U.S. Environmental Protection Agency, the BLM, the U.S. Coast Guard, the Alaska Department of Natural Resources, the Alaska Department of Environmental Conservation, and ADF&G (Gilders, 1997). Agency representatives conduct unannounced inspections of facilities, review permit applications, and oversee every aspect of pipeline operations in Alaska.

In 1991, Alyeska began what was to be the largest post-construction project in the pipeline's history; the Atigun reroute (Gilders, 1997). The reroute began as a result of information supplied by smart pigs used during the first years of the ongoing corrosion investigation. Discovery of corrosion in the buried section of pipe running through Atigun River valley led to the replacement of an 8.5-mile section of pipe in record time. Planning and scheduling for the reroute started in late 1989, construction began in January 1991, and the replacement pipeline was tied in to the system in August 1991. During the tie-in, oil flow was suspended for just 36 minutes. It was a great achievement in project management and execution, requiring careful timing and detailed coordination of some 300 contractor firms and 2,500 personnel. The project was selected as the Project Management Institute's International Project of the year in 1991 (Gilders, 1997).

D.4 Historical Synopsis: Prince William Sound and the *Exxon Valdez* Oil Spill

The supertanker *Exxon Valdez*, carrying a full cargo of over 1.25 million barrels of North Slope crude oil, went off course before midnight on 24 March 1989 after leaving the Valdez Marine Terminal. Shortly thereafter, the ship ran aground on Bligh Reef in northeastern Prince William Sound (PWS). On the order of 257,000 barrels of oil was spilled, or over 10 million gallons. With this event, the

Exxon Valdez Oil Spill (EVOS) was established as the largest oil spill in North America.

The spill was a tragic accident. Exxon immediately took responsibility and committed to cleanup the spill. At the time of the spill, adequate spill response resources were not readily available in Alaska, and they could not be mobilized rapidly enough to contain the spill. Exxon brought in the necessary equipment and people and ultimately spent $2.2 billion on the cleanup. All cleanup activities were conducted under the direction of the Federal On-Scene Coordinator (U.S. Coast Guard) and continued until the U.S. Coast Guard and the State of Alaska declared the cleanup complete in 1992. To mitigate economic impacts of the spill, Exxon set up a claims program within days of the spill to compensate people and businesses that suffered spill-related economic losses. Over $300 million were paid to over 11,000 people and businesses. In 1994 an Anchorage court ruled that the claims program had compensated virtually all the damage claims of individuals and businesses (ExxonMobil, 2000). In 1991, Exxon settled natural resource damage and other claims with the federal government and Alaska for approximately $1 billion (*Exxon Valdez* Oil Spill Trustee Council, 2000). Cleanup activities, environmental impacts, and the status of recovery are discussed below.

At the time of the spill, the PWS environment was generally characterized as "pristine." However, considerable oil spillage had occurred in this region historically, notably during World War II and as a result of the great Alaska earthquake of 1964. The 1964 earthquake dramatically altered vast areas within the intertidal zone by vertically displacing areas of up to 38 feet (Hanna, 1971). Oil and asphalt storage tanks at Valdez and Whittier were ruptured and spilled into the Sound. Thus, the Sound was contaminated with oil residues 25 years before the EVOS, and these residues were still present at the time of the spill (Carlson and Kvenvolden, 1996).

EVOS occurred under calm winds, and the oil spread slowly southwest. Within three days, however, a northerly gale blew the oil slick beyond any hope of containment. The range of the moving oil slick and the dispersal timing are shown in Bernatowicz et al. (1996).

The storm thoroughly mixed the initial slick with subsurface seawater by wave action, promoting solution of sparingly soluble petroleum hydrocarbons into the seawater. Trace amounts of the polynuclear aromatic hydrocarbon (PAH) component of the oil were measured at depths to 15 ft. Subsequently, concentrations of PAHs were highest near heavily oiled beaches. Although PAHs were readily detectable, Short and Harris (1996) noted that concentrations of PAHs were well below levels generally considered toxic to marine fauna. They also noted, however, that PAHs were available to subsurface marine fauna during the first few weeks after the oil spill, especially in nearshore, near-surface waters that they considered to be particularly productive biologically.

By May 1989 — two to three months after the spill — most of the floating oil had either been removed by skimmers, had left the coastal area, evaporated, or degraded, or was stranded on the shoreline (Wolfe et al., 1994). Estimates of the amount of oiled shoreline vary. Exxon Corporation (1992) reported oil on at least 2,090 of the 5,470 km surveyed in 1989, or about 15 percent of the area's 14,480 km, whereas Michel and Hayes (1991) reported some 5,221 km were oiled to some degree, of which 912 km were moderately to heavily oiled. Regardless of the exact measurement, both oiled and unoiled shorelines were home to at least 400 species of marine plants and animals and became the focus of subsequent treatment and cleanup.

As reported by Mearns (1996), the strategy for treating shorelines in 1989 centered on removing as much of the oil as quickly as possible while minimizing impacts to surviving resources. Exxon Production Research Corporation (1990) stated that "the treatment approach was to remove, contain and collect the oil from the shoreline with the least environmental impact, particularly to keep oil off the lower intertidal zone and to avoid oiling other areas." To underscore the drive for an effective response, the U.S. Coast Guard Commandant "made it clear that the administration expected an aggressive and highly visible shoreline cleanup effort" (USCG, 1993).

The shoreline cleanup effort was not only aggressive and highly visible, but diverse. Mearns (1996) provides a detailed synopsis of the treatment methods and a description of the strategy for treating shorelines. He notes that a wide range of methods — from manual pickup and hand-wiping to high-pressure washing — was used to remove oil from the shoreline. In 1989, six task forces, each composed of approximately 1,000 personnel, and more than 100 vessels were deployed in different areas. Several reports discuss operational aspects in more detail (Exxon Production Research Corporation, 1990; Teal, 1991).

Manual treatment included picking up tar balls and pooled oil using absorbent materials; tilling, raking, and shoveling with hand tools; removing oiled debris and tar mats; and cutting and removing seaweed. These efforts were supplemented by mechanical treatment used in 1990 and 1991 to expose buried oil in boulder-cobble beaches. Mechanical treatment involved use of backhoes, tractors, front-end loaders, and other equipment to scoop, dig, and

redistribute beach material. At some sites, tractors pulled steel cable tines to agitate sediment, releasing oil ahead of rising tides (Piper, 1993). In 1990 and 1991, berm relocation was used to open high, intertidal storm berms to expose buried oil and accelerate its weathering (Michel and Hayes 1991). Tractors were also used to dig and flatten storm berms and redistribute the cobble to the mid-intertidal zone. Oil in the open berms was treated with slow-release nutrient capsules in an attempt to accelerate degradation.

Washing coated and remaining pooled oil off rocky surfaces involved use of cold to hot seawater, under low to high pressure, to conduct high-volume flushing (deluge or flooding) of the upper beaches (Exxon Production Research Corporation, 1990; Teal, 1991). For the washing operations, Exxon provided an array of equipment and vessels including more than 600 commercial pressure-washers and 60 landing-craft vessels that supplied either cold water for deluge and hand-held fire hoses or hot water for fire hoses. Generally, multiple hand-held hoses fitted with nozzles were connected in series to delivery barge pumps. In addition, 13 maxi-barges supplied 68°C water through fire hoses mounted on man lifts or cranes to wash vertical rock faces. Finally, 13 Omni-barges were built that supplied 68°C water via spray heads mounted on an articulating crane.

In 1990, a proposal was developed to remove some boulder-cobble beaches, wash the material in a large, specially designed offshore rock washer machine, and then replace the material; the proposal was reviewed in detail and rejected (USCG, 1993).

Bioremediation, to accelerate the chemical degradation of oil not otherwise removed by other treatments, involved application of slow-release pellets containing nitrogen and phosphorus fertilizer, and spraying a liquid oleophilic, urea-based fertilizer (Exxon Production Research Corporation, 1990; Bragg et al., 1992). Despite considerable controversy about results of effectiveness tests and toxicity (Hoff, 1993; Piper, 1993), bioremediation in the form of nutrient applications was approved for use in 1989-92.

Chemicals other than the bioremediation materials were not approved for use during 1989-91, but they were tested. During 1989, at least three sets of shoreline experiments were done to test cleaning agents and dispersants at sites on Disk, Knight, and Smith islands in PWS (Piper, 1993).

The spill was accompanied by large-scale mortality of seabirds and mammals attributable to oiling. Because they rely on the insulating properties of their fur or plumage, some mammals (e.g., otters) and nearly all seabirds are vulnerable to mortality from oiling. In this instance, oiling of the fur and feathers leads quickly to heat loss to the cold water and death due to hypothermia. Additionally, inhalation of fumes, grooming of oiled pelts and plumage, and absorption of oil through the skin may have contributed to the observed levels of acute mortality. Some 36,000 seabird carcasses were recovered after the spill, along with 994 otters (871 carcasses plus 123 deaths at rehabilitation centers). In contrast, only 14 dead seals were recovered. Pinnipeds and cetaceans have layers of subdermal blubber to provide insulation and rely less on their fur.

Loughlin (1994), Wells et al. (1995), and Rice et al. (1996) addressed the acute effects of the EVOS. The consensus of findings was that (1) the EVOS was of sufficient magnitude to be classified as an environmental disaster, but that (2) the estimates of the magnitude of the impact to area resources were very uncertain. Even following extensive research in the 11 years since the spill, there is a high degree of contention regarding the actual level of damage, the recovery standards, and the extent of recovery.

Hilborn (1996) noted that tens of millions of dollars were spent to determine the damage caused by the spill and that most were aimed at detecting population-level impacts on the invertebrates, fishes, birds, and mammals in the spill area. He observed there was a widespread feeling that the studies were not nearly as conclusive as many had hoped and that this had raised concern about the ability to detect oil spill impacts by existing methods. He evaluated five ways to detect population-level impacts, including four that were used predominantly in the EVOS assessments. They were body counts, pre- versus post-spill comparisons, oiled versus non-oiled comparisons of abundance, and oiled versus non-oiled comparisons of vital rates (e.g., growth, egg survival, etc.).

Body counts were available for some bird and marine mammal species. However, body counts by themselves do not provide evidence of population-level impact (Hilborn, 1996). They must be considered in relation to population size, natality, mortality rate, and behavior. For example, even though 902 bald eagles were killed by the spill (11 percent of the estimated population), differences between pre- and post-spill abundance could not be detected. This could be either a result of the high variance in the surveys, or that a one-time mortality was not detectable given year-to-year variation in recruitment and survival, or it could result from compensatory changes in births and deaths.

Any assessment of population-level impacts using body counts needs to be supported by either direct comparisons of pre- and post-spill abundance, oiled versus non-oiled comparisons of abundance, or a population dynamics model that accounts for recruitment and survival (Hilborn,

1996). When pre-spill abundance surveys are available, comparison of pre- and post-spill numbers can be used to assess the change in population. The statistical power of such comparison will depend on the reliability of the census method, the natural variability of the population, and the magnitude of change induced by the spill. This method clearly cannot be used when no pre-spill abundance data are available, as was the case with many fish species affected by the *Exxon Valdez* oil spill. However, pre- and post-spill comparisons were effective in showing changes for many species, including sea otters (Garrott et al., 1993), and pigeon guillemots (Oakley and Kuletz, 1996).

Even when pre-spill data are available, the comparison may be of little value (Hilborn, 1996) Pink salmon, for instance, show very high year-to-year variability, and unless a spill is catastrophic, there is little chance of detecting its impact. In fact, pre- and post-spill comparisons may be deceiving. Geiger et al. (1996) estimated a loss of several million pink salmon because of oiling in 1990, even though the run of pink salmon in 1990 was the largest in history.

Likewise, a significant decline in abundance after a spill is not necessarily evidence of an oil impact (Hilborn, 1996). Populations often vary in abundance, and without evidence of a mechanism for oil impact, such as direct body counts or oiled and non-oiled comparisons, a decline in abundance is not strong proof of an impact of the spill. The disappearance of a number of killer whales from a single pod could be considered evidence of an oil impact, but without supporting mechanisms this evidence of a spill impact is subject to question.

Probably the most common technique used in assessing damage from the *Exxon Valdez* oil spill was post-spill comparison of the abundance of a species in oiled sites to its abundance in non-oiled sites. This technique formed the basis of most intertidal and subtidal assessments (Collier et al., 1996; Highsmith et al., 1996; Jewett et al., 1996). As with pre- and post-spill comparisons, the power of this method depends on the reliability of the census method, the natural variability from site to site, and the magnitude of the change induced by the spill. A key problem is the fact that beaches were oiled as a result of physical processes, whereas in a designed experiment they would have been oiled by random assignment. Thus, post-spill differences may reflect underlying or pre-existing habitat differences rather than the impacts of oiling (Hilborn, 1996). This non-randomization of treatments is in itself not correctable by post-spill analysis, but most investigators attempt to determine if there are other differences between sites and have generally tried to choose control sites that are, to the human observer, as comparable as possible to the treatment sites.

The most convincing data from oiled versus non-oiled comparisons occur when the oiled site recovers to the same abundance as the non-oiled site during the course of the post-spill evaluation (Hilborn, 1996). This set of circumstances strongly suggests that the observed differences immediately after the spill were caused by an oil impact.

An alternative approach to comparing abundance is to measure life history parameters in oiled and non-oiled sites. The estimated parameters are used in a life history model to estimate population-level impacts. The differences in growth observed in oiled versus non-oiled sites (Hepler et al., 1996), and in egg survival for pink salmon (Bue et al., 1996), are examples of how this approach was used to provide evidence of damage even where population-level damage was difficult to measure directly. This approach is weak because it depends on the validity of the population dynamics models used, and in most cases the extent of damage depends on the level of compensatory mortality in the life history after the damage. If there is high density-dependent mortality, the population-level impacts will be much less than the mortality caused by oiling. The potential for compensatory mortality significantly decreases the power of this approach.

Comparison of vital rates between oiled and non-oiled sites also suffers from the weaknesses of non-randomization of treatments discussed above. Again, if vital rates in oiled sites recover to the levels of vital rates in non-oiled sites, the argument that the differences were caused by oil effects rather than pre-existing is much stronger. The continued differences in pink salmon egg survival between oiled and non-oiled sites (Bue et al., 1996) need a more complex mechanism to explain the oil impact and weaken the argument that the differences are attributable to oil.

The assessments of Hilborn (1996) abstracted in the above paragraphs show there is scientific basis for the contention regarding estimates of the magnitude of damage and the status of recovery. The nature of the data allow for legitimate differences in scientific opinion in this regard, and at some point, the arguments transcend what can be addressed by science. Each year, the *Exxon Valdez* Oil Spill Trustee Council provides estimates of the magnitude of the damage and the standard of recovery.

Their opinions regarding damage follow Spies et al. (1996) — namely, that the EVOS resulted in:

- The direct mortality of an estimated 3,500 to 5,500 sea otters, 300 harbor seals, and 250,000 or more birds of 90 species, including Common Murres, and Thick-billed Murres, Bald Eagles, Marbled Murrelets, Kittlitz's Murrelets, Ancient Murrelets, Pigeon Guillemots, two species of puffins, four spe-

cies of loons, and three species of cormorants;
- Significant reductions in the populations of many intertidal organisms, including algae, barnacles, limpets, amphipods, isopods, worms, and fishes, over a very extensive area from PWS to the Kodiak Archipelago and the Alaska Peninsula;
- Significant reductions in populations of subtidal organisms in PWS;
- Increased mortality of Pacific herring eggs in 1989 and increased incidences of aberrations in herring larvae during 1989 and 1990;
- Increased mortality of wild-stock pink salmon eggs in oiled stream beds in 1989-92 and abnormal fry and reduced juvenile growth in 1989, which may have resulted in loss of nearly 2 million pink salmon from the 1990 harvest;
- Poorer growth of Dolly Varden and cutthroat trout for 2 years following the spill;
- Increased vandalism of archaeological resources during the cleanup; and
- Reduced use of subsistence resources.

Spies et al. (1996) note that many of the estimates of injury were very uncertain and that they accrued from a variety of direct and indirect effects.

At present, the *Exxon Valdez* Oil Spill Trustee Council (2000) asserts that of the 28 species/communities/resources injured by the spill, two species (Bald Eagle and river otter) have fully recovered, 13 ecosystem components (species and communities) are exhibiting substantive progress towards the recovery objective, eight species are exhibiting little or no clear improvement since spill injuries occurred, and five system components cannot be characterized in terms of recovery. Further, recreation and tourism, commercial fishing, passive uses, and subsistence uses of the area are considered by the *Exxon Valdez* Oil Spill Trustee Council (2000) to be recovering. The *Exxon Valdez* Oil Spill Trustee Council (2000) notes that it is not clear, however, what role "oil" plays in the inability of some populations to bounce back and that as time passes, separating natural change from oil-spill impacts will become even more difficult.

Exxon and many independent scientists consider the Trustees' conclusions about the status of recovery in Prince William Sound misleading (ExxonMobil, 2000). Exxon suggests that the state of recovery of the Prince William Sound ecosystem cannot be based on the status of the few species investigated by the Trustees while thousands of other species that populate the spill area were either not impacted or were impacted but recovered rapidly. There are also disagreements on the definition of "recovery." The Trustees define "species recovery" as a return to, or increase in, pre-spill population numbers, whereas to many scientists, "recovery" means that a healthy biological community has been re-established with all expected plants and animals present and functioning normally. Under the latter definition, recovery has already occurred, whereas under the Trustees' definition, recovery of certain species might never occur because some populations (e.g., harbor seal, murrelets) were in decline long before EVOS, and a reversal of the trend is questionable even if the spill had not occurred.

The settlement among the State of Alaska, the U.S. government and Exxon was approved by the U.S. District Court on October 9, 1991. It resolved various criminal charges against Exxon, as well as civil claims brought by the federal and state governments for recovery of natural resource damages resulting from the oil spill. Exxon was fined $150 million, the largest fine ever imposed for an environmental crime. The court, however, forgave $125 million of the fine in recognition of Exxon's cooperation in cleaning up the spill and paying certain private claims. Of the remaining $25 million, $12 million went to the North American Wetlands Conservation Fund and $13 million went to the National Victims of Crime Fund. Exxon also agreed to pay $100 million as restitution for the injuries to fish, wildlife, and lands in the spill region (evenly split between the federal and state governments) and $900 million over 10 years as a civil settlement. Exxon also has agreed to provide an additional $100 million if unanticipated losses are discovered.

The *Exxon Valdez* Oil Spill Trustee Council was formed to oversee restoration of the injured ecosystem through use of the $900 million civil settlement. The council consists of three state and three federal trustees. The council adopted a restoration plan in 1994 after an extensive public process including meetings in 22 spill-area communities, as well as in Anchorage, Fairbanks, and Juneau. More than 2,000 people participated in the meetings or sent in written comments. The five-part plan designates $180 million to research, monitoring, and restoration; $392 million for habitat acquisition and protection; $108 million into a savings account to generate long-term funding for restoration after the final payment from Exxon; and $31 million for management and administration including publications and information transfer. The focus of present and future research has been on ecosystem studies and modeling.

Summary

The EVOS was a tragic accident which caused immediate and substantial disruption or harm to the environment,

wildlife, and people of the spill area. Exxon immediately accepted responsibility and set out to clean up the oil. Cleanup under the direction of the U.S. Coast Guard continued until 1992 when both the U.S. Coast Guard and the State of Alaska declared the cleanup complete. Exxon spent over $2.2 billion on the cleanup. To mitigate impacts on the people and communities, Exxon set up a claims program within days of the accident to compensate those damaged by the spill and paid over $300 million to 11,000 individuals and businesses. An Anchorage court ruled in 1994 that Exxon's voluntary payments had already compensated virtually all claims. Exxon settled natural resource damage and other claims with Alaska and the federal government in 1991 for approximately $1 billion.

Consensus exists that the EVOS had an immediate and substantial impact on the environment, wildlife and people in the spill area. The extent of initial injury and the status of recovery from the spill are still being debated; however, the following facts are relevant to cumulative effects:

- There are currently no know impediments to the normal use of Prince William Sound and other areas affected by the spill by people or wildlife.
- All cities and villages in the spill area are functioning essentially as they were before the spill.
- Commercial fishing was closed in 1989 as a result of the spill, but it was reopened in 1990 and record and near record harvests of all commercially important species have occurred since the spill (ExxonMobil, 2000).
- Subsistence harvests by Alaska Natives were disrupted by the spill and cleanup but have subsequently rebounded to pre-spill levels.
- Tourism and recreational use of Prince William Sound has increased to significantly greater levels than prior to the spill.
- Trustees claim 13 of 28 species, communities or resources investigated are not recovering or recovery is unknown (*Exxon Valdez* Oil Spill Trustee Council, 2000) while Exxon and many independent scientists assert that the Trustees' claims are misleading because of a flawed definition of recovery and the fact that thousands of other species in Prince William Sound were not impacted by the spill or were impacted and recovered quickly (ExxonMobil, 2000). Regardless of the debate about recovery, no one has claimed that any species is missing that should be in PWS or that any species was permanently injured or decimated by the spill.

Other large spills, some much larger than EVOS, have been studied and characterized by a Congressional Research Services Report for Congress (Mielke, 1990). The report concluded that "past spills have not been long-lived events." Major ecological impacts occur at the time of the spill or within months of it. Longer term ecological impacts have proved fairly insignificant. Effects from EVOS appear to be following the same trends.

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Appendix E
Federal Agreement and Grant of Right-of-Way for the Trans-Alaska Pipeline

This appendix contains a facsimile of the original Federal Agreement and Grant of Right-of-Way for the Trans-Alaska Pipeline (Federal Grant). The Federal Grant became effective on January 22, 1974, and the State Right-of-Way Lease for the Trans-Alaska Pipeline (State Lease) was executed on May 2, 1974. Both the Federal Grant and State Lease contain technical and environmental stipulations governing the construction and operation of the Trans Alaska Pipeline System (TAPS). This Environmental Report references the federal stipulations, which can be found in Exhibit D of the Federal Grant. (State Lease stipulations are essentially the same as those in the Federal Grant.)

Agreement and Grant of Right-of-Way for Trans-Alaska Pipeline *between* The United States of America *and* Amerada Hess Corporation, ARCO Pipe Line Company, Exxon Pipeline Company, Mobil Alaska Pipeline Company, Phillips Petroleum Company, Sohio Pipe Line Company, and Union Alaska Pipeline Company

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Agreement and Grant of Right-of-Way for Trans-Alaska Pipeline

This Agreement and Grant of Right-of-Way (hereinafter referred to as the "Agreement")* is entered into as of this 23rd day of January, 1974 (hereinafter referred to as the "Effective Date"), by the United States of America, party of the first part (hereinafter referred to as the "United States"), acting through the Secretary of the Interior, and by

Amerada Hess Corporation, a Delaware Corporation,
ARCO Pipe Line Company, a Delaware Corporation,
Exxon Pipeline Company, a Delaware Corporation,
Mobil Alaska Pipeline Company, a Delaware Corporation,
Phillips Petroleum Company, a Delaware Corporation,
Sohio Pipe Line Company, a Delaware Corporation, and
Union Alaska Pipeline Company, a California Corporation,

parties of the second part (hereinafter sometimes referred to as the "Original Permittees").

The parties have entered into this Agreement taking into consideration the national authorizations, directives, and policies expressed in applicable legislation, including Section 202 of the Trans-Alaska Pipeline Authorization Act, 87 Stat. 584, *et seq.* (1973).

It is the intent of the parties that, in the performance of this Agreement, the following principles shall apply:

(1) In the construction (including, but not limited to, design), operation, maintenance (including but not limited to a continuing and reasonable program of preventive maintenance) and termination of the Pipeline System, Permittees shall employ all practicable means and measures to preserve and protect the environment, as provided in this Agreement.

(2) The parties shall balance environmental amenities and values with economic practicalities and technical capabilities, so as to be consistent with applicable national policies. In so doing, the parties shall take into account, among other considerations, the following:

(a) The benefit or detriment to persons, property and the environment that may be anticipated to result from a proposed course of conduct;

(b) The particular environmental, technical, and economical benefits or detriments reasonably expected to flow from a proposed course of conduct;

(c) The effect on the energy needs of the United States, including the possible effects of a disruption of national or regional oil supply, that may result from a particular course of conduct.

(3) Permittees shall manage, supervise and implement the construction, operation, maintenance and termination of the Pipeline System in accordance with sound engineering practice, to the extent allowed by the state of the art and the development of technology. In the exercise of these functions, Permittees consent and shall submit to such review, inspection and compliance procedures relating to construction, operation, maintenance and termination of the Pipeline System as are provided for in this Agreement and other applicable authorizations. The

*NOTE.—Terms having special meaning are defined in the body of this Agreement or in Exhibit D hereof. Such terms are capitalized herein.

parties intend that this Agreement shall not in any way derogate from, or be construed as being inconsistent with, the provisions of Section 203(d) of the Trans-Alaska Pipeline Authorization Act, 87 Stat. 585 (1973), relating to the National Environmental Policy Act, 83 Stat. 852, 42 U.S.C. § 4321 *et seq.*

In consideration of the grant hereby made, and the provisions of this Agreement, the United States and Permittees agree as follows:

1. Grant of Right-of-Way

A. Pursuant to the provisions of the Trans-Alaska Pipeline Authorization Act, the United States hereby grants to Permittees, in the several undivided interests specified in subsection B of this Section, for the period of limited duration prescribed in Section 7 hereof and for the purpose prescribed in subsection A of Section 2 hereof, a right-of-way (hereinafter referred to as the "Right-of-Way"), the width and location thereof being subject to the provisions of Sections 5 and 6 hereof, across, through and upon the Federal Lands (as that term is defined in Section 28 of the Mineral Leasing Act of 1920, 41 Stat. 449, as amended, 30 U.S.C. § 185 *et seq.*, including public and acquired lands, and lands withdrawn, reserved, classified, or otherwise set apart for National Forests, military purposes, power development, or other purposes) along the general route of the Pipeline, identified in the applications and accompanying alignment map and Related Facility site location drawings referred to in Exhibit A hereof.

B. The grant made hereby is of the following undivided interests in and to the Right-of-Way:

Amerada Hess Corporation, an undivided interest of 3.00% of the whole;

ARCO Pipe Line Company, an undivided interest of 28.08% of the whole;

Exxon Pipeline Company, an undivided interest of 25.52% of the whole;

Mobil Alaska Pipeline Company, an undivided interest of 8.68% of the whole;

Phillips Petroleum Company, an undivided interest of 3.32% of the whole;

Sohio Pipe Line Company, an undivided interest of 28.08% of the whole;

Union Alaska Pipeline Company, an undivided interest of 3.32% of the whole.

C. There is hereby excepted from the grant hereby made all lands selected and validly tentatively approved to the State of Alaska, pursuant to the Alaska Statehood Act, 72 Stat. 339, as amended, other than lands withdrawn under Section 11(a)(2) of the Alaska Native Claims Settlement Act, 85 Stat. 696, 43 USC § 1610.

D. There is hereby reserved to the United States all rights reserved, or directed to be reserved, to the United States under any applicable law or regulation of the United States or elsewhere under this Agreement.

E. The grant hereby made is subject to: (1) the provisions of this Agreement; (2) all applicable laws and regulations of the United States; (3) any valid existing rights in the lands subject to the Right-of-Way, including without limitation the valid pre-existing rights, if any, of the State of Alaska; and (4) the condition that the Right-of-Way granted hereby across Category 1(c) Lands and Category 1(d) Lands* shall take effect upon the occurrence of one of the following events, whichever shall first occur:

(a) The Commissioner of Natural Resources of the State of Alaska notifies the Secretary in writing that it is essential for the expeditious construction of the Pipeline System that the Right-of-Way in and to some or all of the Category 1(c) Lands or Category 1(d) Lands, or both, becomes effective;** or

(b) Category 1(d) Lands have not been tentatively approved to the State of Alaska and a valid right-of-way lease or other grant in and to those lands has not been issued by the State of Alaska, for the construction and operation of the Pipeline System, by March 10, 1974; or

(c) The Category 1(c) Lands have not been tentatively approved to the State of Alaska and a valid right-of-way lease or other grant in and to those lands has not been issued by the State of Alaska, for the construction and operation of the Pipeline System, by June 1, 1974.

F. With respect to the Category 1(c) Lands and the Category 1(d) Lands, the grant hereby made

*"Category 1(c) Lands" and "Category 1(d) Lands" are defined in Exhibit D hereto. These terms are derived from Paragraph 1 of Part I of the Cooperative Agreement between the State of Alaska and the Department, attached hereto as Exhibit E for informational purposes.

**The Secretary has received notice from the State Commissioner of Natural Resources that the expeditious construction of the Pipeline System on the Category 1(d) Lands is essential. Therefore, the Right-of-Way across those lands is hereby effective.

is further subject to the limitation and condition that upon either valid tentative approval or valid patent of any of such lands to the State of Alaska, the existence or subsequent issuance of a valid State right-of-way lease or other grant in and to those lands terminates the Right-of-Way and other Federal authorizations, if any, and the State right-of-way lease or other grant thereupon applies in all respects to those lands.

G. Permittees agree that they will not challenge the validity of the State's right-of-way lease or other grant on the basis of the existence of the Federal Right-of-Way and other authorizations or their interest therein.

2. Purpose of Grant; Limitation of Use to Permittees

A. The Right-of-Way is granted for the purpose of the construction, operation, and maintenance of one (1) Oil transportation pipeline, consisting of one (1) line of forty-eight (48)-inch diameter pipe and its Related Facilities (such pipeline and Related Facilities being herein referred to as the "Pipeline").

B. Permittees, their agents, contractors, and subcontractors (at any tier) shall not use the Right-of-Way or the land subject thereto for any other purpose and shall not locate or construct any other pipelines (including looping lines) or other improvements within the Right-of-Way without the prior written approval of the Secretary.

C. The Pipeline shall be used for only the transportation of Oil, and it shall not be used for any other purpose without the prior written approval of the Secretary.

D. Each Permittee shall not allow or suffer any Person or Business Entity, with the exception of the other Permittees under this Agreement, to use the Right-of-Way for the purpose set forth in subsection A of this Section.

E. Nothing above in subsection D of this Section is intended to: (1) excuse or preclude Permittees from complying with their obligations under Section 3 of this Agreement, or (2) preclude Permittees from employing agents, contractors, or subcontractors (at any tier) to effect construction, operation, maintenance or termination of the Pipeline System.

3. Transportation of Oil

Each Permittee shall, to the extent of its interest in the Right-of-Way, and in accordance with the provisions of Section 28 of the Mineral Leasing Act of 1920, 41 Stat. 449, as amended:

(1) Construct, operate, and maintain the the Pipeline as a common carrier;

(2) Accept, convey, transport, or purchase, without discrimination, Oil delivered to the Pipeline without regard to whether such Oil was produced on Federal or non-Federal lands; and

(3) Accept, convey, transport, or purchase, without discrimination, Oil produced from Federal Lands or from the resources thereon in the vicinity of the Pipeline in such proportionate amounts as the Secretary may, after a full hearing with due notice thereof to Permittees and a proper finding of facts, determine to be reasonable.

4. Exhibits; Incorporation of Certain Documents by Reference

A. The Exhibits that are attached to this Agreement and that are listed below in this subsection are, by this reference, incorporated into and made a part of this Agreement as fully and effectually as if the Exhibits were set forth herein in their entirety:

(1) List of applications and accompanying alignment map and site location drawings identifying the general route of the Pipeline, attached hereto as Exhibit A.

(2) Requirements of the Department of Defense relating to military installations, with attached letters dated November 14, 1973, and November 23, 1973, from the Director of Real Estate, Department of the Army, Office of the Chief of Engineers, attached hereto as Exhibit B.

(3) Requirements of the Federal Power Commission relating to power sites, attached hereto as Exhibit C.

(4) Stipulations for the Agreement and Grant of Right-of-Way for the Trans-Alaska Pipeline, being numbered 1 through 3.11.2, inclusive, attached hereto as Exhibit D, which are sometimes referred to in this Agreement as the "Stipulations."

B. The cooperative agreement attached hereto as Exhibit E is not incorporated into, and is not intended to be made a part of, this Agreement. Said cooperative agreement is attached hereto only for informational purposes.

5. Width of Right-of-Way

The width of the Right-of-Way, in terms of surface measurement, is fifty (50) feet plus the ground occupied by the Pipeline; *provided, however*, that up to and including the date on which Permittees may file an application for modification of the Right-of-Way boundaries in accordance with subsection D of Section 6 hereof, Permittees may apply for, and the Authorized Officer may direct or authorize, increases in the width of the Right-of-Way at specified points if he finds, and records the reasons for his finding, that in his judgment a wider Right-of-Way is necessary for operation and maintenance of the Pipeline after construction, or to protect the environment or public safety.

6. Location of Right-of-Way

A. The site for each Construction Segment of the Pipeline shall be determined in accordance with the provisions of Stipulation 1.7.

B. After completion of construction of the Pipeline within a particular Mapping Segment, the Federal Lands subject to the Right-of-Way shall be the land occupied by the Pipeline and, in terms of surface measurement, twenty-five (25) feet on each side of the Pipeline measured from its outermost extremities. With respect to Related Facilities, the width shall be twenty-five (25) feet around the perimeter of the Related Facility.

C. Upon completion of construction of the Pipeline within a Mapping Segment, as well as upon the issuance of any authorization or directive that the Authorized Officer may issue in accordance with the provisions of Section 5 hereof, Permittees shall, if directed by the Authorized Officer, physically mark on the ground the proposed boundaries of the Right-of-Way at such locations and in such manner as is acceptable to the Authorized Officer.

D. At any time prior to the sixtieth (60th) day preceding the filing of the maps of survey as provided in subsection E hereof, Permittees may file an application for modification of the Right-of-Way boundaries provided that, after modification, the Right-of-Way will include the ground occupied by the Pipeline plus fifty (50) feet adjacent thereto and such additional land as authorized by the Authorized Officer pursuant to Section 5 hereof. Upon approval of such application for modification of boundaries and acceptance of the documents and maps required by subsection E hereof, the Right-of-Way shall be as delineated on said maps of survey.

E. Within three hundred and sixty (360) days after the date of Commissioning of the Pipeline (and, in the case of any addition, deletion or alteration of the Pipeline following the date of Commissioning, within one hundred and eighty (180) days after the addition, deletion or alteration has, in the judgment of the Authorized Officer, been fully completed), Permittees shall survey and provide adequate monumentation to locate and describe the Right-of-Way and shall file: (1) proof of construction of the Pipeline in accordance with the applicable regulations of the Department; (2) such documents of relinquishment of land not included in the modified Right-of-Way, if any, as may be required by the Authorized Officer; (3) appropriate references to applications in which requests were made for Right-of-Way widths greater than the normal limitations specified in Section 5 of this Agreement, and applications for modification of the Right-of-Way boundaries as provided in subsection D hereof; and (4) a map, or maps of survey, prepared in such manner as shall be required by the Authorized Officer, showing the final "as built" location of the completed Pipeline, including the final locations of all buried and above ground improvements, the centerline of the Right-of-Way, as definitely located, and, referenced to the centerline, the boundaries of the Right-of-Way, as definitely located. Each portion of the Pipeline as depicted on the said survey map or maps, and for which a Notice to Proceed, or an authorization, issued in accordance with Stipulation 1.7.4.4 altering either the route or the initially approved location along the route of the Right-of-Way, has been issued, shall be referenced to the relevant Notice to Proceed or authorization.

7. Duration of Right-of-Way Grant

A. The grant hereby made of the Right-of-Way shall come to an end and expire on the 22nd day of January, 2004, at noon, Washington, D.C. time, unless prior thereto it is relinquished, abandoned, or otherwise terminated pursuant to the provisions of this Agreement or of any applicable Federal law or regulation.

B. Upon the expiration of the initial or any subsequent grant of the Right-of-Way, or its earlier relinquishment, abandonment, or other termination, the provisions of this Agreement, to the extent applicable, shall continue in effect and shall be binding on the parties hereto, their successors or assigns, until they have fully performed their respective obligations and liabilities accruing before or on account of the expiration, or the prior termination, of the grant.

C. The Right-of-Way shall be renewed, subject to and in accordance with the provisions of the Trans-Alaska Pipeline Authorization Act.

D. Any subsequent conveyance, transfer or other disposition of any right, title or interest in the Federal Lands or any part thereto, burdened by and subservient to the Right-of-Way, shall, to the extent allowed by law and subject to the termination provision of subsection F of Section 1, be subject to the Right-of-Way and the provisions of this Agreement, including Permittees' right to renew the Right-of-Way under subsection C of this Section.

8. Use Charge for Right-of-Way

A. Permittees shall pay to the United States, annually and in advance, the fair market rental value of the Right-of-Way, as determined by the Secretary. (Such rental value is hereinafter called the "Use Charge".)

B. The initial Use Charge shall be One Hundred Five Thousand and 00/100 Dollars ($105,000) for each calendar year. The first annual Use Charge shall be prorated to cover that portion of the calendar year 1974 which remains after the Effective Date hereof and shall be due and payable by not later than the Effective Date hereof. The Use Charge for the first full calendar year commencing after the Effective Date hereof and for each subsequent calendar year shall be due and payable by not later than the last full business day immediately preceding the first day of January of the calendar year for which the Use Charge is payable. The Use Charge for each calendar year shall be billed to Permittees at least thirty (30) days in advance of the due date thereof. All such payments shall be delivered to the Authorized Officer and shall be accepted subject to collection.

C. The Use Charge for the seventh (7th) and for each succeeding calendar year shall be subject to adjustment from time to time in accordance with the regulations of the Department. The Secretary also may adjust retroactively the amount of the annual Use Charge for any calendar year that is based on an appraisal which is made before the Right-of-Way is, in its entirety, finally located, surveyed and monumented; any sum determined by the Secretary to be payable (by either the United States or Permittees) in connection with an adjustment, as provided for in this sentence, shall be due and payable within thirty (30) days after notice is given of the amount due.

9. Construction Plans and Quality Assurance Program

A. Permittees shall submit construction (including design) plans, a quality assurance program, and other related documents as deemed necessary by the Authorized Officer, for review and approval prior to his issuing Notices to Proceed.

B. The quality assurance program shall be comprehensive and designed to assure that the environmental and technical Stipulations in this Agreement will be fully complied with throughout all phases of construction, operation, maintenance and termination of the Pipeline System.

C. The following criteria shall be included in the quality assurance program, although Permittees are not limited to these criteria:

(1) Provide adequate and appropriate means and procedures for the detection and prompt abatement of any actual or potential condition that is susceptible to abatement by Permittees which arises out of, or could affect adversely, the construction, operation, maintenance or termination of all or any part of the Pipeline System and which at any time may cause or threaten to cause: (a) a hazard to the safety of workers or to public health or safety (including but not limited to personal injury or loss of life with respect to any person or persons) or (b) serious and irreparable

harm or damage to the environment (including but not limited to areas of vegetation or timber, fish or other wildlife populations, or their habitats, or any other natural resource).

(2) Provide adequate and appropriate means and procedures for the repair and replacement of improved or tangible property and the rehabilitation of natural resources (including but not limited to revegetation, restocking fish or other wildlife populations and reestablishing their habitats) that shall be seriously damaged or destroyed if the immediate cause of the damage or destruction arises in connection with, or results from, the construction, operation, maintenance or termination of all or any part of the Pipeline System.

(3) Provide for component and systems quality through adequate quality control management and planning, and inspection and test procedures.

(4) Assure that the selection of Permittees' contractors, subcontractors and contract purchases of materials and services are based upon the above quality control procedures.

(5) Determine quality performance by conducting surveys and field inspections of all of the facilities of Permittees' contractors and subcontractors.

(6) Maintain quality determination records on all of the above procedures to insure satisfactory data identification and retrieval.

10. Compliance With Notices To Proceed

All construction of the Pipeline System undertaken by Permittees shall comply in all respects with the provisions of Notices to Proceed that are issued by the Authorized Officer.

11. Reservation of Certain Rights to the United States

A. The United States reserves and shall have a continuing and reasonable right of access to any part of the lands (including the subsurface of, and the air space above, such lands) that are subject to the Right-of-Way, and a continuing and reasonable right of physical entry to any part of the Pipeline, for inspection or monitoring purposes and for any other purpose or reason that is reasonably consistent with any right or obligation of the United States under any law or regulation, this Agreement, or any other agreement, permit or authorization relating in whole or in part to all or any part of the Pipeline.

B. The rights of access and entry reserved in subsection A of this Section shall extend to and be enjoyed by any contractor of the United States, any subcontractors (at any tier) of the contractor and their respective agents and employees, as well as such other persons, as may be designated from time-to-time in writing by the Authorized Officer.

C. There is reserved to the United States the right to grant additional permits or easements for rights-of-way to third parties for compatible uses on, or adjacent to, the lands subject to the Right-of-Way. Before the United States grants an additional right-of-way or permit for a compatible use, the United States will notify Permittees of its intentions and shall consult with Permittees before taking final action in that regard.

12. Reimbursement of Department Expenses

A. Permittees shall reimburse the United States for all reasonable administrative and other costs heretofore or hereafter incurred directly or indirectly by the Department for: (1) processing applications filed by Permittees in connection with the Pipeline System; and (2) monitoring the construction, operation, maintenance, and termination of all or any part of the Pipeline System, including without limitation those portions of the System that shall be located on State-owned lands.

B. Subject to collection, receipt is hereby acknowledged by the Department of the sum of Twelve Million Two Hundred Fifty Three Thousand Seven Hundred Thirty and 00/100 Dollars ($12,253,730) which has been paid to the United States by Permittees at the time of execution of this Agreement. Said sum represents the amount of the costs referred to in subsection A of this Section, which were incurred by the Department through September 30, 1973.

C. Permittees shall hereafter pay to the United States such sums as the Secretary shall determine to be required to reimburse the Department for the costs, referred to in subsection A of this Section, incurred or to be incurred by it subsequent to September 30, 1973. Such payments shall be made in

accordance with the provisions of subsection F of this Section.

D. Permittees acknowledge that the Department has employed or may employ one or more independent consultants, contractors and subcontractors and also has utilized and may utilize personnel and services of other agencies to assist it with: (1) processing applications heretofore or hereafter filed by Permittees in connection with the Pipeline System; and (2) monitoring the construction, operation, maintenance and termination of the Pipeline System. Before employing such consultants, contractors, or subcontractors, the Secretary shall notify Permittees of such employment and shall inform the Permittees of the purpose of employment, the scope of the work to be undertaken, the duration of the employment and the estimated cost thereof; *provided*, *however*, this notice requirement shall not limit the authority of the Secretary to enter into agreements with consultants, contractors or subcontractors. Costs incurred by the Department in connection with the employment of consultants, contractors and subcontractors and with respect to utilizing the personnel and services of other agencies shall be included in the costs for which the Department is to be reimbursed by Permittees under the provisions of subsection A of this Section.

E. Agreements entered into by the Secretary with respect to the Pipeline System which result in costs for which reimbursement is required by this Section shall be drawn to avoid unnecessary employment of personnel and needless expenditure of funds. The Department shall administer this Agreement and such other agreements to reasonably assure that unnecessary employment of personnel and needless expenditure of funds are avoided.

F. Reimbursement by Permittees, as provided for in this Section and Section 18 hereof, shall be made for each quarter ending on the last day of March, June, September and December. On or before the sixtieth (60th) day after the close of each quarter, the Authorized Officer shall submit to Permittees a written statement of the costs incurred by the Department during that quarter which are reimbursable.

G. Permittees shall have the right to conduct, at their own expense, reasonable audits by auditors or accountants, designated by Permittees, of the books, records and documents of the Department and of its independent consultants, contractors and subcontractors relating to the items on any particular statement that shall be submitted in accordance with the procedure outlined in subsection F of this Section, at the places where such books, records and documents are usually maintained and at reasonable times; *provided*, *however*, that written notice of a desire to conduct such an audit must be given the Authorized Officer: (1) at least fifteen (15) days prior to such audit; and (2) by not later than the seventy-fifth (75th) day after the close of the quarter for which the books, records and documents are sought to be audited; and *provided further*, that any such audits shall be completed within ninety (90) days after receipt by Permittees of the statement containing the items to be audited.

H. Nothing herein shall be deemed to require the Department, its bureaus or offices, or its independent consultants, contractors and subcontractors to maintain books, records or documents other than those usually maintained by them, provided that such books, records and documents reasonably segregate and identify the costs for which reimbursement is required by this Section. Such books, records and documents shall be preserved or caused to be preserved for a period of at least two (2) years after the Department submits a statement for reimbursement based on such books, records and documents. The auditors or accountants designated by Permittees shall have reasonable access to, and the right to copy, at their expense, all such books, records and documents, including all audit reports prepared by or furnished to the Department, together with supporting documents in the possession of the Department, concerning agreements with other agencies employed by the Department and with its independent consultants, contractors and subcontractors, which result in costs for which reimbursement is required by this Section.

I. With respect to the audits by Permittees of any books, records and documents of the Department and its independent consultants, contractors or subcontractors under agreements which result in costs for which reimbursement is required by this Section, such audits shall be conducted by independent certified public accountants, designated by Permittees. Prior to conducting any such audits, such accountants shall confer with the auditors auditing such consultants, contractors or subcontractors for the Department for the purpose of coordinating and expediting their

respective audits. Any such audits by such accountants shall be conducted as supplementary audits, reviewing and spot checking the audits of the Department's auditors for the purpose of determining the accuracy of costs reflected in the billings of the Department which are reimburseable under subsection A of this Section, and auditing such other matters as may be appropriate in the circumstances. The Authorized Officer may designate a representative to observe any such audits by such accountants. The Authorized Officer shall have reasonable access to, and the right to copy, all such audit reports prepared by such accountants and furnished to Permittees, together with supporting documents in the possession of the Permittees. In the event that the Authorized Officer believes that the scope of any such supplementary audit is unreasonable, he shall promptly notify Permittees and such accountants, and such supplementary audit shall be suspended pending consultation by the Authorized Officer and the Permittees of the appropriate scope of audit in the circumstances. Any complaints which Permittees may have with respect to such agreements, their performance or the statement of the Department for the reimbursement of costs based on such agreements shall be made only to the Authorized Officer.

J. Permittees shall pay to the United States, through the Authorized Officer, the total amount as shown on each statement by not later than the due date thereof, namely the ninetieth (90th) day following the close of the quarter to which the statement relates; *provided*, *however*, that if any one or more of the Permittees decides to dispute or audit any item of a statement that shall be rendered in accordance with the provisions of this Section or Section 18 hereof, Permittees, on or before the said 90th day on which the statement is due and payable, shall give the Authorized Officer written notice of each item that is disputed, accompanied by a detailed explanation of their objection, or written notice of each item to be audited, and shall pay to the United States, through the Authorized Officer, those amounts for the items that are not disputed or are not to be audited. If any item of a statement is audited, Permittees shall give the Authorized Officer prompt written notice of the completion of the audit of all the items of a statement being audited. On a date fixed by the Authorized Officer, but in any event to be within thirty (30) days after notice of a disputed statement or after notice of the completion of the audit, as the case may be, the Authorized Officer and Permittees shall meet to discuss, and attempt to resolve, all items which are disputed or which have not been resolved by the audit. If at that time they are unable to resolve all such items, Permittees may appeal any unresolved items to the Secretary in accordance with the provisions of subsection A of Section 26 of this Agreement. Any items resolved as being payable to the United States shall be paid within thirty (30) days after being resolved, together with interest thereon up to the date of payment at a total annual percentage rate equal to the discount rate of the Federal Reserve Bank for District 12 (San Francisco) in effect on the original due date of the statement, and such interest shall accrue and be computed from, and so as to include, the aforesaid due date. The items shown on any statement that are not the subject of both: (1) a notice to the Authorized Officer of a disputed item or notice of audit, and (2) a notice of appeal as provided for in subsection A of Section 26, shall be deemed conclusively to be payable to the United States by Permittee.

K. In addition to the right to audit quarterly statements as provided in subsection G of this Section, if Permittees believe that unnecessary employment of personnel or needless expenditure of funds has occurred or is likely to occur contrary to the provisions of subsection E of this Section, Permittees may request the approval of the Authorized Officer for Permittees to conduct promptly and at their own expense a full and complete audit by auditors or accountants designated by Permittees, of the books, records and documents concerning the matters to be audited, at the places where such books, records and documents are usually maintained and at reasonable times. Such request shall be in writing, shall specify the matters to be audited and shall state the information available to Permittees upon which the request is based. The Authorized Officer shall approve or deny such request promptly, and approval of any such request shall not be unreasonably withheld. If and to the extent that any such audit concerns any agreements of the Department with independent consultants, contractors or subcontractors which have resulted or may result in costs for which reimbursement is required by this Section, such audit shall be conducted by independent certified public accountants designated by Permittees. The Authorized Officer may designate a representative

to observe any audit allowed by this subsection and the Authorized Officer may have access to, and the right to copy, the audit report prepared by such accountants and furnished to Permittees. Any complaint which Permittees may have as a result of any audit under this subsection shall be made only to the Authorized Officer and shall be governed by the procedure set forth in subsection J of this Section, to the extent applicable.

13. Damage to United States Property; Repair, Replacement or Claim for Damages

A. Subject to the provisions of subsection 204 (a) (2) of the Trans-Alaska Pipeline Authorization Act, at the written demand of the Authorized Officer, Permittees:

(1) shall repair or replace promptly, to the written satisfaction of the Authorized Officer, all improved or tangible property of the United States, whether real, personal or mixed, that has been seriously damaged or destroyed and is included in the demand, and

(2) shall rehabilitate (including, but not limited to, revegetation, restocking fish or other wildlife populations and reestablishing their habitats), to the written satisfaction of the Authorized Officer, any natural resource that shall be seriously damaged or destroyed,

if the immediate cause of the damage or destruction arises out of, is connected with, or results from, the construction, operation, maintenance or termination of all or any part of the Pipeline System; *provided*, *however*, that Permittees shall not be obligated to repair or replace any property or to rehabilitate any natural resource that was damaged or destroyed: (a) by an act of war or (b) solely by (i) the negligence of the United States and/or (ii) the negligence or willful misconduct of Persons who are authorized to enter upon, use or occupy the damaged property or areas pursuant to any Federal lease, permit, or other written authorization that is issued for any use or purpose other than in connection with the construction, operation, maintenance or termination of the Pipeline.

B. The repair or replacement by the Permittees of any improved or tangible property of the United States, as provided for in subsection A of this Section, shall operate to preclude the United States from asserting any claim for direct (as opposed to consequential) money damages with respect to the damage or destruction that was so repaired or replaced.

C. Except to the extent that a claim by the United States for money damages against any one or more of the Permittees shall be barred in accordance with the provisions of subsections A and B of this Section, Permittees shall be liable to the United States, with respect to improved or tangible property of the United States, whether real, personal or mixed, that is damaged or destroyed in connection with or resulting from activities along or in the vicinity of the Right-of-Way in accordance with the provisions of Section 204 of the Trans-Alaska Pipeline Authorization Act.

D. In the event that a Permittee shall be liable to the United States for any damage, destruction or loss of improved or tangible property of the United States whether real, personal or mixed, the collection by the United States of money damages on account of the particular loss, damage or destruction, shall to the extent collected operate to preclude the United States from enforcing the provisions of subsection A of this Section with respect to such loss, damage or destruction.

14. Indemnification of the United States

A. Permittees shall indemnify and hold harmless the United States, its agents and employees, against and from any and all liabilities or damages of any nature whatsoever which the United States, its agents, employees, contractors or subcontractors (at any tier) become legally obligated to pay, and which arise out of, or are connected with, any one or more of the following: (1) the construction, operation, maintenance or termination of the Pipeline System; (2) the approval (as distinguished from the ordering of a modification pursuant to Stipulation 1.3.2.) by the United States, its agents, employees, contractors or subcontractors (at any tier), of any design, plan, Construction Mode, construction or research pertaining to the Pipeline System or any part thereof; or (3) the physical entry by any Person upon, or the use or occupancy by any Person of, any Federal Land that is the subject of any use or right which is granted or afforded to Permittees, or to their respective agents, employees, contractors or subcontractors (at any tier) in connection with the

Pipeline System; *provided, however*, that the provisions of items (1) and (3) of this Section shall not be deemed to apply to liabilities or damages that are caused: (a) by an act of war; or (b) solely by (i) the negligence of the United States, and/or (ii) the negligence or willful misconduct of an agent, employee, contractor or subcontractor (at any tier) of the United States not acting within the scope of his authority or employment, and/or (iii) the negligence or willful misconduct of persons who are authorized to enter upon, use or occupy the damaged property or areas pursuant to any Federal lease, permit, or other written authorization that is issued for any use or purpose other than in connection with the construction, operation, maintenance or termination of the Pipeline System.

B. Permittees shall be notified in writing of any claim for which indemnity under the provisions of this Section is sought, and such claim shall not be compromised without the written consent of Permittees, which consent Permittees agree shall not be unreasonably withheld or delayed.

C. The regulations of the Department relating to indemnification of the United States against any liability for damages to life, person or property arising from the occupancy or use of the lands under a right-of-way (43 CFR 2801.1–5(f) (1972)) shall not be applicable to this Agreement.

15. Guaranty

A. Upon being notified by the Secretary to do so, each Permittee shall cause to be delivered to the Secretary a valid and unconditional guaranty of the full and timely payment of all liabilities and obligations of the Permittee to the United States under or in connection with this Agreement or any other agreement, permit or authorization to be issued or granted to the Permittees by the Secretary that relates in whole or in part to all or any part of the Pipeline System.

B. It is recognized that a proposed guarantor of a Permittee may be a corporation (or an individual stockholder thereof), a partnership (or an individual partner thereof), an association that is authorized and empowered to sue and be sued and to hold the title to property in its own name (or an individual associate thereof), a joint stock company that is authorized and empowered to sue and be sued and to hold the title to property in its own name (or any individual participant therein), or a business trust (or an individual settlor thereof), and may or may not directly or indirectly own a legal or beneficial interest in the Permittee whose liabilities and obligations are sought to be guaranteed. In the case of multiple guarantors that are acceptable to the Secretary, each shall be severally liable for only its proportionate share of any sum or payment covered by the guaranty.

C. Each guaranty shall be satisfactory to the Secretary in all respects including, without limitation, the form and substance of the guaranty, the financial capability of a proposed guarantor, the availability of such guarantor to service of process, the availability of the assets of such guarantor with respect to the enforcement of judgments against the guarantor, and the number of guarantors that will be necessary to guarantee all of the liabilities and obligations which will be covered by a particular guaranty; *provided, however*, that the Secretary shall not unreasonably withhold his approval with respect to a guaranty or guarantor.

D. The Secretary shall have the right at any time, and from time to time, to require the substitution and delivery of a new form of guaranty in the event that an outstanding guaranty is held to be invalid or unenforceable, in whole or in part, by a court of competent jurisdiction or, that the controlling law shall, by statute or judicial decision, be so altered as to impair, prevent or nullify the enforcement or exercise of any right or option of the United States under an outstanding guaranty; *provided, however*, that the outstanding guaranty (to the extent of its validity or enforceability, if any) shall continue in full force and effect with respect to any claim, suit, accrued liability or defense thereunder that exists at the time of substitution; *provided further*, that the new form of guaranty, in each such case, shall be required as to all Permittees that at the time of substitution have delivered, or are required to deliver, a guaranty.

E. Each guaranty shall be accompanied by such certificates and opinions of legal counsel as the Secretary may require to establish its validity. The guaranty shall include an appointment of an agent for service of process that is satisfactory to the Secretary.

16. Laws and Regulations

A. Permittees, and each of them, shall comply with all applicable Federal laws and regulations, existing or hereafter enacted or promulgated.

B. In any event, Permittees, and each of them, shall comply with: (1) all regulations hereafter promulgated to implement the Trans-Alaska Pipeline Authorization Act, and (2) all applicable regulations hereafter promulgated to implement Section 28 of the Mineral Leasing Act of 1920, as amended.

17. No Right of Set Off

A. With respect to any sum now or hereafter owing, or claimed to be owing, to the United States and that arises out of or is connected in any way with the construction, operation, maintenance or termination of all or any part of the Pipeline System, Permittees, and each of them, shall not set off against, or otherwise deduct from, any such sum:

(1) Any claim or judgment for money of any one or more of the Permittees against the United States not arising out of the construction, operation, maintenance or termination of all or any part of the Pipeline System;

(2) Any claim or judgment for money of any one or more of the Permittees against the United States that arises out of the construction, operation, maintenance or termination of all or any part of the Pipeline System, if the sum now or hereafter owing, or claimed to be owing, to the United States is or shall be for any sum or charge required to be paid to the United States pursuant to Section 8, Section 12 or Section 18 hereof; or

(3) Any claim or judgment for money of any one or more of the Permittees against the United States that arises out of, or pursuant to, any statute administered by any department or agency of the United States other than the Department.

18. Right of United States To Perform

A. If, after thirty (30) days, or in an emergency such shorter period as shall not be unreasonable, following the making of a demand therefor by the Authorized Officer, in the manner that is provided in Stipulation 1.6 for giving written notices, Permittees, or their respective agents, employees, contractors or subcontractors (at any tier), shall fail or refuse to perform any of the actions required by the provisions listed in subsection B of this Section, the United States shall have the right, but not the obligation, to perform any or all of such actions at the sole expense of Permittees. Prior to the delivery of any such demand, the Authorized Office shall confer with Permittees, if he deems it practicable to do so, regarding the required action or actions that are included in the demand. The Authorized Officer, following the procedure outlined in subsection F of Section 12 hereof, shall submit to Permittees a statement of the expenses incurred by the United States during the preceding quarter in the performance by the United States of any required action and, in the absence of a dispute, the amounts shown to be due on each such statement shall be paid by Permittees in accordance with the provisions of the said last mentioned subsection. If any one or more of the Permittees shall dispute the amount of any item in any statement that shall be rendered in accordance with the provisions of this Section, the procedures outlined in subsection J of Section 12 shall apply with equal force and effect to any such dispute. Permittees may dispute whether the work involved an action required by a provision listed in subsection B of this Section, whether Permittees' failure or refusal to perform any such action was justified, as well as the reasonableness of the specifications for, and the cost of, such work.

B. Required Action (In General) and Reference:*

Survey, map and mark the Right-of-Way—Sec. 6.

Repair, replace, rehabilitate property and natural resources—Sec. 13.

Discharge liens—Sec. 19.

Abate any condition causing or threatening to cause a hazard, harm or damage—Sec. 24.

Provide emergency aid—Sec. 30.

Provide an archeologist to perform certain duties—Stip. 1.9.

Remove improvements and equipment and restore land—Stip. 1.10.1.

Put areas "to bed"—Stip. 1.10.2.

Protect certain improvements; remove obstructions; repair damage to public utilities and improvements—Stip. 1.11.

Regulate public access—Stip. 1.12.1.

Provide alternative routes for roads and trails—Stip. 1.12.2.

*"Sec." refers to Sections of this Agreement. "Stip." refers to the Stipulations, attached as Exhibit D hereto.

Provide public crossings—Stip. 1.12.3.
Screen, filter, suppress electronic devices—Stip. 1.13.1.
Post the Right-of-Way against hunting, etc.—Stip. 1.14.1.
Restore survey monuments, etc.—Stip. 1.16.2.
Take measures to protect health and safety; abate hazards—Stip. 1.20.
Provide for environmental briefings—Stip. 2.1.1.
Remove waste—Stip 2.2.6.2.
Stabilize disturbed areas—Stip. 2.4.2.2.
Remove temporary fill ramps—Stip 2.4.3.2.
Seed and plant disturbed areas—Stip 2.4.4.1.
Dispose of excavated material—Stip. 2.4.5.
Provide for uninterrupted movement and safe passage of fish—Stip. 2.5.1.1.
Screen pump intakes—Stip. 2.5.1.2.
Plug, stabilize abandoned water diversion structures—Stip 2.5.1.3.
Construct levees, etc.—Stip. 2.5.1.4.
Construct new channels—Stip. 2.5.2.2.
Protect Fish Spawning Beds from sediment; construct settling basins—Stip 2.5.2.3.
Repair damage to Fish Spawning Beds—Stip. 2.5.2.4.
Assure big game passage—Stip. 2.5.4.1.
Remove certain debris—Stip. 2.7.2.5.
Dispose of slash (where "otherwise directed.")—Stip. 2.7.2.8.
Take certain mitigation measures—Stip. 2.8.1.
Restore disturbed areas—Stip. 2.12.1.
Stabilize slopes—Stip. 2.12.2.
Dispose of certain materials—Stip. 2.12.3, Stip. 2.12.4.
Remove equipment and supplies—Stip. 2.12.5.
Clean up, repair, if Oil or other pollutant is discharged—Stip. 2.14.4.
Inspect welds—Stip. 3.2.2.3.
Inspect Pipeline System construction—Stip. 3.2.2.4.
Perform seismic monitoring—Stip. 3.4.2.3.
Construct stilling basins; stabilize pool sides—Stip. 3.6.2.1.
Provide Oil spill containment structures—Stip. 3.11.1, Stip. 3.11.2.

19. Liens

A. Each Permittee shall, with reasonable diligence, discharge any lien against Federal Lands that results from any failure or refusal on its part to pay or satisfy any judgment or obligation that arises out of or is connected in any way with the construction, operation, maintenance or termination of all or any part of the Pipeline System.

B. However, Permittees shall prevent the foreclosure of any lien against any title, right, or interest of the United States in said lands.

C. The foregoing provisions of this Section shall not be construed to constitute the consent of the United States to the creation of any lien against Federal Lands or to be in derogation of any prohibition or limitation with respect to such liens that may now or hereafter exist.

20. Insolvency

If at any time there shall be filed by or against any Permittee, or any guarantor furnishing a guaranty in accordance with the provisions of Section 15 hereof, in any court of competent jurisdiction, a petition in bankruptcy or insolvency or for reorganization or for the appointment of a receiver or trustee of all or a portion of the Permittee's or such guarantor's property, or if any Permittee, or any such guarantor, makes an assignment for the benefit of creditors or takes advantage of any insolvency act, and, in the case of an involuntary proceeding, within sixty (60) days after the initiation of the proceeding the Permittee or such guarantor fails to secure a discontinuance of the proceeding, the Secretary may, if the Secretary so elects, at any time thereafter, declare such to be a breach of this Agreement by the Permittee or, in cases involving a guarantor, the Permittee for which the guaranty was furnished.

21. Breach; Extent of Liability of Permittees

A. The liabilities and obligations of each Permittee under this Agreement are joint and several except that the liabilities and obligations of each Permittee are several under the following Sections: 2.D (Purpose of Grant; Limitation of Use to Permittees), 3 (Transportation of Oil), 8 (Use Charge for Right-of-Way), 12 (Reimbursement of Department Expenses), 13.C (Damage to United States Property; Repair, Replacement or Claim for Damages), 14 (Indemnification of United States), 15 (Guaranty), 18 (Right of the United States to Perform), 19.A (Liens), 20 (Insolvency), 22 (Transfer), 32 (Release of

Right-of-Way), 33.B and 33.C, to the extent that performance may be required by less than all of the Permittees (Agreements Among Permittees), 34. (Access to Documents), 41 (Authority to Enter Agreement), Stipulation 1.4 (Common Agent), and Stipulation 1.10.1 (Completion of Use); *provided, however*, that as to any obligation to pay money to the United States, each such Permittee shall not be liable for any greater portion thereof than an amount which is equal to the product of the total obligation or liability when multiplied by a fraction, the numerator thereof being the individual Permittee's interest in the Right-of-Way at the time of the breach (such interest being expressed as a percentage for purposes of the numerator), and the denominator therof being the aggregate of all of the interests in the Right-of-Way that were held by all of the Permittees at the time the obligation becomes due and payable (the aggregate of such interest being expressed as a percentage for purposes of the denominator).

22. Transfer

A. Permittees, and each of them, shall not, without obtaining the prior written consent of the Secretary, Transfer in whole or in part any right, title or interest in this Agreement or the Right-of-Way. Any such Transfer other than with respect to an Involuntary Passage of Title, without in each instance obtaining the prior written consent thereto of the Secretary, shall be absolutely void, and, at the option of the Secretary, shall be deemed to be a breach of this Agreement by each Permittee so violating this Agreement.

B. Any Involuntary Passage of Title with respect to any right, title or interest in this Agreement or the Right-of-Way that shall be attempted or effected without in each instance obtaining the prior written consent thereto of the Secretary shall, to the extent permitted by law, be voidable at the option of the Secretary, and, in addition, at the option of the Secretary, shall be deemed to be a breach of this Agreement by the affected Permittee; *provided, however*, that nothing in this subsection shall be deemed to prohibit, or to limit in any way, the exercise of any right or option of the United States under Section 20 of this Agreement.

C. With respect to any Transfer that shall relate to this Agreement or the Right-of-Way, the Transferor, the Transferee and the guarantor or guarantors, if any, of the Transferee shall apply for the Secretary's written consent to the Transfer by filing with the Secretary all documents or other information that may be required by law or regulation, this Agreement or any other agreement, permit, or authorization of the United States relating to the Pipeline System or any part thereof and, upon request from the Secretary, such other documents and information as may be relevant to the Secretary's determination.

D. Before the Secretary acts in connection with an application for his consent with respect to the Transfer of an interest in the Right-of-Way, the Transferee shall demonstrate, to the satisfaction of the Secretary, that the Transferee is capable of performing all of the liabilities and obligations of the Transferor relating to the interest to be transferred. In considering an application for such consent, the Secretary shall make a determination, in accordance with Section 28(j) of the Mineral Leasing Act of 1920, as amended, concerning: (1) the technical capability of the Transferee, and (2) the financial capability of the Transferee, or of the Transferee together with, if any, its proposed guarantor or guarantors as approved by the Secretary, to perform all of the liabilities and obligations of the Transferor relating to the interest to be transferred.

E. In connection with any Transfer, the Secretary may request the right to audit and/or inspect, in whole or in part, the pertinent books, records, accounts, contracts, commitments, and property of the Transferee and of the proposed guarantor or guarantors, if any, of the Transferee, at the sole expense of the Transferor, which expense shall be paid to the United States upon completion of the inspection and/or audit and before the Secretary acts in connection with the application for his consent to the Transfer. If any such request shall be refused such refusal shall be deemed to be a sufficient reason for the Secretary to withhold his consent to the pertinent Transfer. The Transferee and its guarantor or guarantors, if any, shall consent in writing to the provisions of this subsection when applying for the consent of the Secretary.

F. The Secretary, shall not unreasonably withhold his consent to any Transfer hereunder, but may withhold or revoke his consent to any Transfer if:

(1) At the time of, or before, the consummation of the Transfer, there shall have oc-

curred any breach, by the Transferor or any predecessor of the Transferor, of this Agreement or of any other agreement, permit, or authorization relating to the Pipeline System that the United States may make with, issue to, or grant to the Transferor, and that was not cured to the satisfaction of the United States before the consummation of the Transfer, or

(2) With respect to Transfers other than those referred to in subsection H of this Section, the Transferee, or the Transferee together with, if any, its guarantor or guarantors as approved by the Secretary: (a) is not, or are not, capable, in the judgment of the Secretary, of performing all of the liabilities and obligations of the Transferor relating to the right, title or interest to be transferred, or (b) shall refuse to allow an audit and/or inspection as provided for in subsection E of this Section; or

(3) Applicable laws and regulations in effect at the time of a Transfer shall not have been complied with by the parties to the Transfer.

G. A Permittee seeking to be divested in whole or in part of its right, title, and interest in and to the Right-of-Way and this Agreement in connection with a Transfer shall be released from its liabilities and obligations (accrued, contingent, or otherwise) to the United States under this Agreement to the extent and limit that the Transferee assumes unconditionally the performance and observance of each such liability and obligation, *provided:*

(1) All of the provisions of this Agreement with respect to the approval or disapproval of the Transfer have been fully complied with to the satisfaction of the Secretary;

(2) The Secretary has consented in writing to to the Transfer; and

(3) Thereafter the Transfer and the attendant assumption agreement, if any, are in fact duly consummated on the basis of the documents previously presented to the Secretary for his review, and the Secretary is so notified in writing by the parties to the Transfer.

H. The Secretary shall consent to the Transfer of an interest in the Right-of-Way between:

(1) Any of the Original Permittees, their Affiliates or any of them, or

(2) One or more of the Original Permittees, their Affiliates or any of them, and a corporate Transferee, all of the outstanding capital stock of which Transferee at the time of the Transfer is owned by one or more of the Original Permittees or their Affiliates, or

(3) One or more of the Original Permittees, their Affiliates or any of them, and a partnership consisting of two (2) or more of the Original Permittees or their Affiliates;

provided, that the Transferor or Transferee are not in breach of this Agreement; *provided further*, that all applicable laws and regulations in effect at the time of Transfer are complied with; *provided further*, that the application for any such Transfer be filed with the Secretary within eight (8) years of the Effective Date hereof or prior to completion of construction of the Pipeline at its maximum design capacity (i.e. approximately two million (2,000,000) barrels per day) whichever shall first occur; and *provided further*, that no substantial reduction in the financial worth of the Transferee (or its Parent), or of the Transferee (or its Parent) together with its guarantors, if any, has occurred since the date the Transferee (or its Parent) acquired its original interest in the Right-of-Way.

23. Port Valdez Terminal Facility

A. The provisions of this Section shall apply to the construction and operation of the terminal facility of the Pipeline System located at Port Valdez, Alaska.

B. Permittees shall maintain and operate a waste-water treatment facility in conjunction with the terminal facility at Port Valdez. All oily-water (including, but not limited to, discharge from fuel tanks, cargo tanks, ballast tanks, and bilges) discharged from any tanker or other seagoing, bulk Oil carrier (hereinafter referred to as a "Vessel") loading at or from the terminal facility shall be received and treated by said waste-water treatment facility. Water discharged from the waste-water treatment facility shall not con-

tain more than 10 parts of oil per million parts of water, on a weekly (seven (7) day) average.

C. At reasonable intervals, but at least once in every five (5) year period, the Authorized Officer and Permittees, at the request of either, shall meet to review and consider in depth: (1) the operation of the waste-water treatment facility; (2) such advances and improvements in water pollution control and waste-water treatment, technology and equipment, as they relate to the terminal facility, as have taken place; and (3) the feasibility of improving the performance of the facility through installation of new or additional equipment, or modification of existing equipment. Consideration of such feasibility shall include consideration of the degree of technological advances that have occurred, costs and economic feasibility, the types of equipment commercially available, and the benefits that would be derived from the installation of new or additional equipment or the modification of existing equipment.

D. Permittees, and their respective agents, employees, contractors and subcontractors (at any tier) shall not release, or suffer to be released, from the terminal facility any Oil to be loaded on any Vessel unless the provisions of subsections E and F of this Section have, in each case, been fully complied with.

E. Prior to loading Oil on any Vessel, Permittees shall require the master thereof to provide Permittees with a legible copy, certified under oath by the master as being true and correct, of:

(1) in the case of Vessels of United States registry, that part of the oil record book of such Vessel that pertains to the voyage of the Vessel to the terminal facility from its last Oil discharge port;

(2) in the case of Vessels of foreign registry that may now or hereafter be required to maintain an oil record book, or similar records, that part of the oil record book, or said records, that pertains to the voyage of the Vessel to the terminal facility from its last Oil discharge port; and

(3) in the case of any Vessel of foreign registry that is not required to maintain an oil record book, or similar records, Permittees shall require the master thereof to provide Permittees with an affidavit, duly sworn to and signed by the master, stating any and all facts bearing upon any discharge of Oil or oily water from the Vessel during its voyage to the terminal facility from its last Oil discharge port.

F. If the said record book entries or affidavit, as provided by the master, disclose:

(1) that the Vessel has discharged any Oil or oily water from its fuel tanks, cargo tanks, bilge, or otherwise, and

(2) that such discharge was not necessary for the safety of the Vessel or its crew,

Permittees shall promptly notify the Authorized Officer of the pertinent facts and shall not load the Vessel or suffer the Vessel to be loaded, unless at the time of such discharge:

(a) The United States Coast Guard or other agency of the United States has promulgated and implemented regulations under one or more treaties, conventions, or statutes that are designed to deter Vessels subject to such treaties, conventions or statutes from discharging any Oil or oily water at sea and that apply to, and can be enforced by the United States Coast Guard or such other agency of the United States against, the offending Vessel; or

(b) In the absence of the aforesaid regulations, or the inapplicability thereof to the offending Vessel, there shall be in effect port rules, approved in writing by the Authorized Officer for the purposes of this subsection F, for the port of Valdez or, as the case may be, the terminal facility, (which rules may provide for a demurrage charge against offending vessels) that are designed to deter any Vessel using the terminal facility from discharging Oil or oily water at sea and that apply to, and can be enforced against, the offending vessel; or

(c) If neither subsection F(a) or F(b) above in this Section shall be applicable, Permittees may proceed subject to applicable laws and regulations, to load the Vessel at the terminal facility; *provided, however*, that during its next return voyage to the terminal facility, one of either of the following alternatives must be complied with before the Vessel can be loaded:

(i)(AA) The Vessel shall, prior to loading, remain for ten

(10) consecutive hours (the "Standdown Period") in an area designated by the Authorized Officer, not nearer than fifty (50) nautical miles or farther than one hundred (100) nautical miles from the port of Valdez;

(BB) The Vessel's master shall enter in the ship's log the time and position of the Vessel at the commencement and termination of the Standdown Period, as well as the hourly positions of the Vessel during said period;

(CC) The Vessel's position at the point of departure, upon completion of the Standdown Period, shall not be greater than five (5) nautical miles from the Vessel's position at the commencement of such period; and

(DD) Prior to loading the Vessel, Permittees shall receive from the master of the Vessel a legible copy, certified under oath by the master as being true and correct, of the aforementioned entries in the ship's log; or

ii) (AA) The Vessel shall proceed to Valdez at a reduced rate of speed so that the voyage to Valdez (from its last port of call before such voyage) requires at least ten (10) hours additional to the period of time the voyage would otherwise have taken; and

(BB) Prior to loading the Vessel, Permittees shall receive from the master of the Vessel a legible copy, certified as being true and correct, of the entries in the ship's log which demonstrate compliance with the aforementioned return-voyage requirements.

Notwithstanding the foregoing provisions of subsections F(c)(i) and F(c)(ii), the Authorized Officer may temporarily waive compliance with the return-voyage requirements (on such terms as the Authorized Officer may prescribe) if, from the ship's log and corroborative evidence, it is clearly demonstrated that compliance would have seriously jeopardized the safety of the ship or crew.

G. If a Vessel shall have been loaded at the terminal facility without being subjected to any of the alternatives that are prescribed in subsection F of this Section, and it should later be determined that the portion of the oil record book, a copy of which was furnished to Permittees prior to such loading, or affidavit, as the case may be, contained any false or misleading statement or did not contain a required entry or statement, and if the entry or statement had been properly made the Vessel would have been subject to the aforesaid alternatives, then the Vessel shall be subject to the provisions of subsections E and F on its return voyage to the terminal facility next following the date on which the Authorized Officer notifies Permittees and the owner and/or, if any, the charterer of such Vessel of the aforementioned determination.

H. Permittees shall:

(1) Publish the restrictions placed on the loading of Vessels at the terminal facility under this Section in the port manual for the port of Valdez or, as the case may be, the terminal facility and, if legally permissible, in the tariff or tariffs pertaining to the transportation of Oil through the Pipeline; and

(2) Give the public such other notice of said restrictions as Permittees or the Authorized Officer may, from time to time, consider to be necessary or appropriate.

I. Permittees shall maintain books and records in connection with the operation of the waste-water treatment facility. Said books and records shall at least show, for each Vessel discharging into said facility, the name, tonnage (D.W.T.) and such other information as may be appropriate to identify the Vessel, the date of each discharge, the

amount of ballast water discharged on each occasion, the amount of other oily water discharged on each occasion, and the amount of Oil that was loaded on each occasion from the terminal facility.

J. Permittees shall retain, for an appropriate period, as prescribed by the Authorized Officer, all documents furnished to Permittees pursuant to subsections E and F of this Section and the books and records specified in subsection I of this Section; and the Authorized Officer shall have access thereto at all reasonable times for the purpose of inspection and copying.

K. Permittees shall comply with all Federal, State and local laws and regulations existing or hereafter enacted or promulgated affecting in any manner the construction and operation of the terminal facility. If any such law or regulation governs specifically any particular requirement or standard that is prescribed in this Section. Permittees shall comply with the requirement or standard established by such law or regulation and, so long as compliance is required, Permittees shall be relieved of any obligation to comply with the particular requirement or standard of this Section that is governed by such law or regulation.

24. Duty of Permittees To Abate

A. Permittees promptly shall abate, either completely or, as the case may be, as completely as possible using their best efforts, any physical or mechanical procedure, activity, event or condition, existing or occurring at any time: (1) that is susceptible to abatement by Permittees, (2) which arises out of, or could affect adversely, the construction, operation, maintenance or termination of all or any part of the Pipeline System, and (3) that causes or threatens to cause: (a) a hazard to the safety of workers or to public health or safety (including but not limited to personal injury or loss of life with respect to any Person or Persons), or (b) serious and irreparable harm or damage to the environment (including but not limited to areas of vegetation or timber, fish or other wildlife populations, or their habitats, or any other natural resource).

B. Permittees shall cause their respective agents, employees, contractors and subcontractors (at any tier) to observe and comply with the foregoing provisions of this Section.

25. Temporary Suspension Orders of Authorized Officer

A. The Authorized Officer may at any time order the temporary suspension of any or all construction, operation, maintenance or termination activities of Permittees, their agents, employees, contractors or subcontractors (at any tier) in connection with the Pipeline System, including but not limited to the transportation of Oil, if in the judgment of the Authorized Officer:

(1) An immediate temporary suspension of such activities is necessary to protect: (a) public health or safety (including, but not limited to, personal injury or loss of life with respect to any Person or Persons); or (b) the environment from immediate, serious, substantial and irreparable harm or damage (including, but not limited to, harm or damage to areas of vegetation or timber, fish or other wildlife populations, or their habitats, or any other natural resource); or

(2) Permittees, their respective agents, employees, contractors or subcontractors (at any tier) are failing or refusing, or have failed or refused, to comply with or observe: (a) any provision of this Agreement necessary to protect public health, safety or the environment; or (b) any order of the Authorized Officer implementing any such provision of this Agreement or of any other agreement, permit or authorization that shall have been duly approved, issued or granted by the Secretary in connection with all or any part of the Pipeline System.

B. The following shall be applicable to any temporary suspension order that may be issued in accordance with the provisions of subsection A of this Section, if the order would have the effect of suspending (1) operation of the entire Pipeline, (2) transportation of Oil through the Pipeline, (3) operation of the entire Valdez terminal facility, or (4) construction of an entire Construction Subdivision:

(a) If the order is issued in accordance with subsection A(1) of this Section, the Authorized Officer shall transmit a copy of the order, and a preliminary report with respect to the order, to the Secretary

within six (6) hours after the order has been issued and, thereafter, the Authorized Officer's report and the order will be reviewed promptly by the Secretary; *provided*, *however*, that nothing herein shall require the Secretary to take any action following such review; or

(b) If the order is to be issued in accordance with subsection A(2) of this Section, the Authorized Officer shall not issue the order unless and until the Secretary gives to the Authorized Officer the Secretary's prior written approval with respect to the order.

C. The Authorized Officer shall give Permittees prior notice of the temporary suspension order as he deems practicable. If circumstances permit, the Authorized Officer shall consult with Permittees, prior to issuing the order, to discuss appropriate measures to (1) forthwith abate or avoid the harm or threatened harm that is the reason for the issuance of the order, or (2) effect compliance with the provision or order, whichever is applicable.

D. After a temporary suspension order has been given by the Authorized Officer, Permittees shall promptly comply with all of the provisions of the order and shall not resume any activity suspended or curtailed thereby except as provided in this Agreement or pursuant to court order.

E. Any temporary suspension order which, in an emergency, is given orally shall be confirmed in writing, as provided for in Stipulation 1.6.2. Each written order or written confirmation of an order shall set forth the reasons for the suspension. Each temporary suspension order shall be limited, insofar as is practicable, to the particular area or activity that is or may be affected by the activities or conditions that are the basis of the order. Each order shall be effective as of the date and time given, unless it specifies otherwise. Each order shall remain in full force and effect until modified or revoked in writing by the Authorized Officer or the Secretary.

F. Resumption of any suspended activity shall be promptly authorized by the Authorized Officer in writing when he is satisfied that (1) the harm or threatened harm has been abated or remedied, or (2) Permittees have effected, or are ready, willing and able to effect compliance with the provision or order, whichever is applicable.

G. Any temporary suspension order that is given or issued in accordance with this Section shall be subject to the provisions of Stipulation 1.5.1.

26. Appeal Procedure

A. Appeals from Temporary Suspension Orders of Authorized Officer; Appeals from Denials of Resumption of Suspended Activities

(1) Permittees may appeal directly to the Secretary: (a) any temporary suspension order issued by the Authorized Officer pursuant to Section 25 of this Agreement; and (b) any denial by the Authorized Officer of a request for resumption of activities suspended pursuant to such a temporary suspension order. If a right of appeal is to be preserved, Permittees shall file a notice of appeal with the Secretary within fifteen (15) days from the effective date of the order or denial being appealed. The notice shall set forth with particularity the order or denial being appealed. To perfect an appeal, Permittees shall file with the Secretary within thirty (30) days from the effective date of the order or denial being appealed a statement of the facts of the matter and a statement of the applicable law, supplemented by such documentation and arguments on the facts and the law as Permittees may wish to present to justify modification or reversal of the order or denial. All statements of fact shall be under oath.

(2) Except as provided hereinafter in this Section, the Secretary shall decide the appeal within thirty (30) days from the date Permittees' appeal is perfected. If the Secretary does not render a decision within that time, the appeal shall be considered to have been denied by the Secretary, and such denial shall constitute the final administrative decision of the Department.

(3) Except for any decision that may be made by the Secretary after his review as provided for in subsection B(a) of Section 25 hereof, any decisions of the Secretary, with respect to any appeal within the Department as to any matter arising out of this Agreement, shall constitute the final administrative decision of the Department.

B. Expedited Appeals

(1) Permittees shall be entitled to an expedited appeal to the Secretary from any temporary suspension order, or order denying resumption of suspended activities (except any refusal to issue a Notice to Proceed or the issuance of a Notice to

Proceed that may not be substantially in accord with the application therefor), issued by the Authorized Officer and that suspends, or denies resumption of, the following: (a) operation of the entire Pipeline; (b) transportation of Oil through the Pipeline; (c) operation of the entire Valdez terminal facility; or (d) construction of an entire Construction Subdivision.

(2) Permittees may occasionally, from time to time, during construction of the Pipeline System, designate an order not covered by subsection B(1) of this Section but which the Permittees deem critical and which the Secretary shall consider as an expedited appeal. Such designation shall be made in the notice of appeal, and shall be supported by factual information, under oath, to confirm that the affected activity is one of critical importance.

(3) The Secretary shall render a decision so as to dispose of the expedited appeal within the shortest possible time and in all events within seven (7) days of the date of filing of the documents required to perfect an appeal. If the Secretary does not render a decision within such time, the appeal may be deemed by Permittees to have been denied by the Secretary, and such denial shall constitute the final administrative decision of the Department.

C. Appeals with Respect to Notices to Proceed

(1) Permittees may appeal to the Secretary if, with respect to a particular application for a Notice to Proceed: (a) the Authorized Officer has refused to issue the Notice to Proceed within the time prescribed pursuant to Stipulation 1.7.4; or (b) the Authorized Officer has issued a Notice to Proceed not substantially in accord with the application therefor. If the Authorized Officer has not acted within the prescribed time to either issue or deny the issuance of the Notice to Proceed, such failure to act shall be deemed to be a refusal by the Authorized Officer to issue the Notice to Proceed.

(2) The ground or grounds for such an appeal shall be one or more of the following:

(a) The Authorized Officer has construed the applicable Stipulations erroneously; or

(b) The Authorized Officer has imposed arbitrary and capricious requirements to enforce the Stipulations; or

(c) Permittees have made a bona fide effort to meet the requirements of the Authorized Officer, but are unable to comply; or

(d) By failing to act upon the requested Notice to Proceed, within the prescribed time, the Authorized Officer has been unreasonable.

(3) Each appeal under this subsection shall be subject to the appeal procedure set forth in subsection A of this Section.

27. Requests To Resume; Appeals

A. If by a temporary suspension order issued pursuant to Section 25 of this Agreement, the Authorized Officer has ordered the suspension of an activity of Permittees, Permittees may at any time thereafter file with the Authorized Officer a request for permission to resume that activity on the ground that the reason for the suspension no longer exists. The request shall contain a statement, under oath, of the facts which in Permittees' view support the propriety of resumption.

B. The Authorized Officer shall render a decision, either granting or denying the request, within five (5) days of the date that the request was filed with him. If the Authorized Officer does not render a decision within that time, the request shall be considered denied and Permittee may appeal the denial to the Secretary in accordance with the provisions of Section 26 of this Agreement.

C. If, at the time the request to resume is filed with the Authorized Officer, the Authorized Officer's order suspending the activity is pending before the Secretary pursuant to a perfected appeal, the Authorized Officer shall nonetheless proceed to act upon the request. If the Authorized Officer grants the request that action shall be determinative of both the request and the pending appeal.

28. Nondiscrimination and Equal Employment Opportunity

A. Permittees shall assure that no person shall on the grounds of race, creed, color, national origin or sex be excluded from receiving or participating in any activity, including all aspects of employment and contracting, conducted under any permit, right-of-way, public land order, or other Federal authorization granted or issued under the Trans-Alaska Pipeline Authorization Act. Permittees shall comply with all regulations that shall be

promulgated by the Secretary to implement this provision.

B. Permittees agree that, during the period of construction of the Pipeline System and for so long as the Pipeline System, or any portion thereof, shall be in operation, or for so long as this Agreement shall be in effect, whichever is the longer:

(1) Permittees will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. Permittees will take affirmative action to ensure that applicants are employed, and that employees are equally treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. Permittees agree to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Authorized Officer setting forth the provisions of this equal opportunity clause.

(2) Permittees will, in all solicitations or advertisements for employees placed by or on behalf of Permittees, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

(3) Permittees will send to each labor union or representative of workers with which Permittees have a collective bargaining agreement or other contract or understanding, a notice, to be provided by the Authorized Officer, advising the labor union or workers' representative of Permittees' commitments under this equal opportunity clause and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) Permittees will comply with Executive Order No. 11246 of September 24, 1965, as amended, and rules and regulations and relevant orders of the Secretary of Labor.

(5) Permittees will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, as amended, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to Permittees' books, records, and accounts by the Authorized Officer and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(6) In the event of Permittees' noncompliance with this equal opportunity clause or with any of said rules, regulations or orders, this Agreement may be terminated or suspended in whole or in part by the Secretary, in accordance with the provisions of Section 403 of the Act of November 16, 1973, 87 Stat. 590 (1973) and in the manner provided in Section 31 hereof, and Permittees may be declared ineligible for further government contracts in accordance with procedures authorized in Executive Order No. 11246 of September 24, 1965, as amended, and such other sanctions may be imposed and remedies invoked as provided in Executive Order No. 11246 of September 24, 1965, as amended, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(7) Permittees will include the provisions of an equal opportunity clause as established by regulation of the Secretary in every contract, subcontract or purchase order unless exempted so that such provisions will be binding upon each contractor, subcontractor (at any tier) or vendor. Permittees will take such action with respect to any contract, subcontract, or purchase order as the Authorized Officer may direct as a means of enforcing such provisions including sanctions for noncompliance; *provided*, *however*, that in the event Permittees become involved in or are threatened with litigation with a contractor, subcontractor (at any tier) or vendor as a result of such direction by the Authorized Officer, Permittees may request the United States to enter into such liti-

gation to protect the interests of the United States.

Permittees further agree that they will be bound by the equal opportunity clause (i.e., subsections (1) through (7) of this subsection B) with respect to their own employment practices when they participate in federally assisted construction work.

C. Permittees agree that they will assist and cooperate actively with the Authorized Officer and the Secretary of Labor in obtaining the compliance of contractors and subcontractors (at any tier) with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, pursuant to the Executive Order, that they will furnish the Authorized Officer and the Secretary of Labor such information as they may require for the supervision of such compliance, and that they will otherwise assist the Authorized Officer in the discharge of the Department's primary responsibility for securing compliance.

D. Permittees further agree that they will refrain from entering into any contract or contract modification subject to Executive Order No. 11246 of September 24, 1965, with a contractor debarred from Government contracts and federally assisted construction contracts and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the Authorized Officer or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, Permittees agree that if they fail or refuse to comply with these undertakings, the Secretary may take any or all of the following actions: terminate or suspend the Right-of-Way in whole or in part, in accordance with the provisions of Section 403 of the Act of November 16, 1973, 87 Stat. 590 (1973), and in the manner provided in Section 31 hereof; refrain from extending any further assistance to Permittees under the program with respect to which the failure or refusal occurred until satisfactory assurance of future compliance has been received from Permittees; and refer the case to the Department of Justice for appropriate legal proceedings.

E. By accepting this Agreement, Permittees certify that Permittees do not and will not maintain or provide for Permittees' employees any Segregated Facilities at any of Permittees' establishments and that Permittees do not and will not permit Permittees' employees to perform their services at any location, under Permittees' control, where Segregated Facilities are maintained. Permittees agree that a breach of this certification is a violation of the equal opportunity clause of this Agreement. As used in this certification, the term "Segregated Facilities" means, but is not limited to, any waiting rooms, work areas, rest rooms, and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin, because of habit, local custom or otherwise. Permittees further agree that (except where Permittees have obtained identical certifications from proposed contractors and subcontractors (at any tier) for specific time periods) Permittees will obtain identical certifications from proposed contractors and subcontractors (at any tier) prior to the award of contracts or subcontracts exceeding $10,000 which are not exempt from the provisions of the equal opportunity clause; that Permittees will retain such certifications in Permittees' files; and that Permittees will forward the following notice to such proposed contractors and subcontractors (except where the proposed contractors or subcontractors have submitted identical certifications for specific time periods): "NOTICE TO PROSPECTIVE CONTRACTORS AND SUBCONTRACTORS OF REQUIREMENT FOR CERTIFICATION OF NONSEGREGATED FACILITIES." A Certification of Nonsegregated Facilities, as required by the order (32 F.R. 7439, May 19, 1967) on Elimination of Segregated Facilities, by the Secretary of Labor, must be submitted prior to the award of a contract or subcontract exceeding $10,000 which is not exempt from the provisions of the equal opportunity clause. The certification may be submitted either for each contract and subcontract or for all contracts and subcontracts during a period (i.e., quarterly, semiannually, or annually).

29. Training of Alaska Natives

A. Permittees shall enter into an Agreement with the Secretary regarding recruitment, testing, training, placement, employment, and job counselling of Alaska Natives.

B. During construction and operation of the Pipeline System, Permittees shall conduct a pre-employment and on-the-job training program for Alaska Natives designed to qualify them for initial employment in connection with the Pipeline System and for advancement to higher paying positions thereafter.

C. Permittees shall do everything practicable to secure the employment, in connection with the Pipeline System, of those Alaska Natives who successfully complete Permittees' training program. Permittees shall inform the Authorized Officer of the discharge from such employment of each and every Alaska Native and of the reason therefor, in advance of such discharge whenever possible or, if advance notice is impossible, as soon thereafter as is practicable.

D. Permittees shall furnish such information and reports concerning Alaska Native employment as the Authorized Officer shall require from time to time.

30. Native and Other Subsistence

A. To the extent practicable, Permittees shall not damage any fish, wildlife or biotic resources in the general area of the Right-of-Way upon which Persons living in the area rely for subsistence purposes; and Permittees will comply promptly with all requirements and orders of the Secretary to protect the interests of Persons living in the general area of the Right-of-Way who rely on the fish, wildlife and biotic resources of the area for subsistence purposes.

B. Upon the order of the Secretary, Permittees shall provide emergency subsistence and other aid, as required by the Secretary, to any affected Alaska Native, Native organization or other Person pending expeditious filing of, and determination of, a claim by such Alaska Native, Native organization or other Person under Section 204(a) of the Trans-Alaska Pipeline Authorization Act. The Secretary's decision to issue an order may be based on statements, made under oath, by such Alaska Native, Native organization or other Person seeking emergency aid.

31. Termination or Suspension of Right-of-Way

A. Any failure or refusal of any Permittee, its agents, employees, contractors or subcontractors (at any tier), or any of them, to observe or comply substantially with any applicable provision of Section 28 of the Mineral Leasing Act of 1920, as amended, the Trans-Alaska Pipeline Authorization Act, the regulations of the Secretary implementative thereof, or any provision of this Agreement required or authorized by such statutes, shall be deemed to constitute a breach of this Agreement, said breach being determined to be joint and several or several according to the provisions of Section 21 hereof, and, at the option of the Secretary, may be grounds for termination or formal suspension of such Permittee's interest in the Right-of-Way; *provided, however*, if, as determined in accordance with the provisions of Section 21 hereof, the breach results in several (as opposed to joint and several) liability, the interest in the Right-of-Way of a Permittee which is not liable for the breach shall not be subject to termination or formal suspension on account of the breach.

B. The failure or refusal of Permittees to proceed with reasonable diligence to construct the Pipeline shall be grounds for termination or formal suspension of the Right-of-Way in a proceeding brought under Section 28(o) of the Mineral Leasing Act, as amended; *provided, however*, that the Right-of-Way shall not be terminated or suspended if the failure to proceed to construct the Pipeline is due to circumstances beyond the control of the Permittees.

C. Abandonment of the Right-of-Way shall not constitute a breach of this Agreement but may, at the option of the Secretary, be grounds for termination of the Right-of-Way. Deliberate failure of Permittees, for any continuous two-year period (whether or not calculated on a calendar-year basis), to use the Right-of-Way for the purpose for which it was granted shall constitute a rebuttable presumption of abandonment of the Right-of-Way. However, where such failure to use the Right-of-Way is due to circumstances not within Permittees' control, the Secretary is not required to commence proceedings under Section 28(o) of the Mineral Leasing Act of 1920, as amended.

D. Administrative proceedings to terminate or formally suspend the Right-of-Way under subsections A and B of this Section shall be conducted pursuant to Title 5, United States Code, Section 554, and the applicable regulations of the Secretary.

E. Before the Secretary authorizes the commencement of any administrative proceeding un-

der Title 5, United States Code, Section 554, for the termination or formal suspension of any interest in the Right-of-Way, the Authorized Officer shall give the affected Permittee or Permittees notice in writing of the alleged ground or grounds for termination or formal suspension, with sufficient particularity to enable the Permittee or Permittees to cure if the ground or grounds that are alleged constitute a breach of this Agreement. The Permittee or Permittees shall have:

(a) thirty (30) days, in the case of any failure or refusal to pay money, and

(b) sixty (60) days in all other cases,

from (and not including) the date of delivery of the notice within which to cure the alleged breach or breaches of this Agreement. If the alleged breach or breaches (other than with respect to the payment of money) cannot be cured within sixty (60) days, the Permittee or Permittees shall be entitled to such additional time as may be necessary to cure; *provided, however*, that the affected Permittee or Permittees (whose interest in the Right-of-Way would be terminated or formally suspended if the United States prevailed in a proceeding to terminate or formally suspend the interest on the ground or grounds asserted in the notice) first demonstrate to the satisfaction of the Authorized Officer that the necessary curative actions were undertaken promptly and have been diligently prosecuted towards completion; *provided further*, that the aforesaid additional time to cure shall not exceed ninety (90) days from (and not including) the last day of the said sixty (60) day period, without the prior written consent of the Authorized Officer, which shall specify the last day (to be determined by the Authorized Officer) upon which the curative action must be completed to the satisfaction of the Authorized Officer. The consent of the Authorized Officer to additional time (in excess of the said ninety (90) day period) to cure shall not be unreasonably withheld, and shall normally be given in situations involving physical activities of Permittees in connection with construction, maintenance, operation or termination of the Pipeline which Permittees can demonstrate require more time.

F. The foregoing provisions of subsection E of this Section shall not apply with respect to a breach under any one or more of the following Sections of the Agreement: 20 (Insolvency), 24 (Duty of Permittees to Abate), 25 (Temporary Suspension of Activities).

32. Release of Right-of-Way

A. In connection with the relinquishment, abandonment or other termination before the expiration of the grant of the Right-of-Way, of any right or interest in the Right-of-Way, and/or in the use of all or any part of the lands subject to the Right-of-Way, each Permittee holding such right or interest shall promptly execute and deliver to the United States, through the Authorized Officer, a valid instrument of release in recordable form, which shall be executed and acknowledged with the same formalities as a deed. The instrument of release shall contain, among other things, appropriate recitals, a description of the pertinent rights and interests, and, for the benefit of the United States and its grantees or assigns, express representations and warranties by the Permittee that it is the sole owner and holder of the rights or interests described therein and that such rights or interests are free and clear of all liens, equities or claims of any kind requiring or that may require the consent of a third party, claiming in whole or in part by, through or under the Permittee, for the valid release or extinguishment thereof, except for such that are owned or claimed by third parties which have joined in the execution of the release. The form and substantive content of each instrument of release shall be approved by the Authorized Officer but, except as otherwise expressly provided for above in this subsection in no event shall any such instrument operate to increase the then-existing liabilities and obligations of the Permittee furnishing the release.

B. Each release shall be accompanied by such resolutions and certifications as the Authorized Officer may require in connection with the power or the authority of the Permittee, or of any officer or agent acting on its behalf, to execute, acknowledge or deliver the release.

C. Neither the tender, nor the approval and/or acceptance, of any such release shall operate as an estoppel or waiver of any claim or judgment against a Permittee or to relieve or discharge, in whole or in part, any Permittee of and from any of its then-existing liabilities or obligations (accrued, contingent or otherwise); and, notwithstanding any such tender or delivery, or any approval of the Authorized Officer, if a release shall contain any provision that operates, or that by implication might operate, to discharge or relieve,

in whole or in part, a Permittee of and from any of its liabilities or obligations (accrued, contingent or otherwise) or that operates or might operate as an estoppel or waiver of any claim or judgment against a Permittee, or as a covenant not to sue, such provision shall be, and shall be deemed to be, void and of no effect whatsoever insofar as it would have the effect of so discharging or relieving a Permittee or operating as an estoppel, waiver or covenant not to sue.

33. Agreements Among Permittees

A. The Original Permittees, and each of them, represent and covenant with the United States that they have entered into only the following agreements, and no other agreements, written or oral (excluding prior agreements that no longer have any force or effect), which establish each Original Permittee's interest in the Pipeline System venture and each Original Permittee's relationships with the common agent, as referred to in Stipulation 1.4, for all or any phase of the construction, operation, maintenance and termination of the Pipeline System or any part thereof:

(1) Agreement entitled "Trans-Alaska Pipeline System Agreement", dated as of August 27, 1970, by and among Atlantic Pipe Line Company,* BP Pipe Line Corporation,* Humble Pipe Line Company,* Amerada Hess Corporation, Home Pipe Line Company, Mobil Pipe Line Company, Phillips Petroleum Company, and Union Oil Company of California, with Exhibit "C", entitled "Enabling Agreement", annexed thereto;

(2) Agreement entitled "First Supplemental Agreement", dated as of August 27, 1970, by the same parties;

(3) Agreement entitled "Second Supplemental Agreement", dated as of August 27, 1970, by the same parties;

(4) Agreement entitled "Third Supplemental Agreement", dated as of August 27, 1970, by the same parties;

(5) Agreement entitled "Fourth Supplemental Agreement", dated as of August 27, 1970, by the same parties;

(6) Agreement entitled "Fifth Supplemental Agreement", dated as of August 27, 1970, by the same parties;

(7) Agreement entitled "Agreement for the Design and Construction of the Trans-Alaska Pipeline System", dated as of August 27, 1970, by and among Atlantic Pipe Line Company, BP Pipe Line Corporation, Humble Pipe Line Company, Amerada Hess Corporation, Home Pipe Line Company, Mobil Pipe Line Company, Phillips Petroleum Company, Union Oil Company of California, and Alyeska Pipeline Service Company;

(8) Agreement entitled "Shareholders Agreement for Alyeska Pipeline Service Company", dated as of August 27, 1970, by the same parties as those listed with respect to the agreement referred to immediately above;

(9) Assignment, Assumption, Release and Consent Agreement, dated as of August 28, 1970, in connection with the transfer by Home Pipe Line Company to the other participating companies of all of its rights, title, and interest in the Pipeline System and in the foregoing agreements, and as a shareholder in and to Alyeska Pipeline Service Company.

(10) Assignment, Conveyance, and Transfer Agreement, dated December 11, 1973, in connection with the transfer by Mobil Pipe Line Company to Mobil Alaska Pipeline Company, a Delaware Corporation, of all of the former company's rights under all agreements relating to the Trans-Alaska Pipeline System, to which the former company is a party, and all real or personal property in which the former company may have acquired an ownership interest pursuant to such agreements, and under which Assignment, Conveyance and Transfer Agreement Mobil Alaska Pipeline Company assumes all undischarged obligations of Mobil Pipe Line Company under any and all of the above mentioned Trans-Alaska Pipeline System agreements, together with certain supporting documents (five in

*ARCO Pipe Line Company, a Delaware corporation, represents and covenants that it is the successor by merger to all of the rights and obligations of Atlantic Pipe Line Company. Sohio Pipe Line Company, a Delaware corporation, represents and covenants that it is the successor by merger to all of the rights and obligations of BP Pipe Line Corporation. Exxon Pipeline Company, a Delaware corporation, represents and covenants that it is the same corporation as Humble Pipe Line Company, but that its name has been duly changed to "Exxon Pipeline Company."

number) each dated December 11, 1973; and

(11) Assignment, Conveyance, and Transfer Agreement, dated January 8, 1974, in connection with the transfer by Union Oil Company of California to Union Alaska Pipeline Company, a California Corporation, of all of the former company's rights under all agreements relating to the Trans-Alaska Pipeline System to which the former company is a party, and all real or personal property in which the former company may have acquired an ownership interest pursuant to such agreements, and under which Assignment, Conveyance and Transfer Agreement Union Alaska Pipeline Company assumes all undischarged obligations of Union Oil Company of California under any and all of the above mentioned Trans-Alaska Pipeline System agreements.

B. Said agreements are referred to collectively as the "Ownership Agreements." Each affected Permittee shall file promptly with the Authorized Officer true and complete copies of all modifications of the Ownership Agreements and of all instruments superseding, supplementing, cancelling or rescinding, in whole or in part, any one or more of the Ownership Agreements.

C. In the event Permittees execute an "Operating Agreement", as contemplated in Section 5.1 of the agreement described in subsection A(1) above in this Section, or any like or similar agreement with respect to the operation, maintenance, or termination of all or any part of the Pipeline System, Permittees shall file promptly with the Authorized Officer a true and complete copy thereof, together with like copies of all modifications of, and all agreements superseding, supplementing, cancelling or rescinding, in whole or in part, the Operating Agreement or any such like or similar agreement.

34. Access to Documents

A. As to any documents or records not filed (or required to be filed under any other provision of this Agreement) with the Secretary or the Authorized Officer that shall be relevant to the exercise or enforcement by the Secretary of his authority or the rights of the United States under or in connection with this Agreement or with respect to all or any part of the Pipeline System, the Secretary shall have the right, after notice to the affected Permittee, to inspect and copy: (1) any document or record which a Permittee is required by this Agreement to make or maintain, (2) any document or record that at any time has been filed by a Permittee with any governmental department or agency, access to which is not prohibited or limited by law or regulation, or (3) any abstract, summary or other document that may have been prepared by any governmental department or agency in connection with any document or record referred to in (2) above.

B. Subject to the requirement that the documents or records, herein below referred to, shall be relevant to the exercise or enforcement by the Secretary of his authority or the rights of the United States under or in connection with this Agreement or with respect to all or any part of the Pipeline System, the Secretary, after notice to the affected Permittee, may inspect and, with the consent of the affected Permittee (which consent each Permittee agrees will not be unreasonably withheld or delayed), may copy any document or record that has been or may hereafter be filed by a Permittee with any governmental agency, access to which is prohibited or limited by law or regulation, and any abstract, summary or other document that may have been prepared by a governmental department or agency in connection with any such document or record; *provided*, *however*, that the rights of the Secretary under this subsection may be exercised only if, and to the extent that, this provision constitutes a valid waiver of any such prohibition or limitation.

C. Nothing in this Section shall be deemed to limit, prohibit, or waive any right or privilege of the United States, and particularly of the Secretary, to inspect or copy any document or record under any authority granted pursuant to law or regulations.

35. Rights of Third Parties

The parties hereto do not intend to create any rights under this Agreement that may be enforced by third parties for their own benefit or for the benefit of others.

36. Covenants Independent

Each and every covenant contained in this Agreement is, and shall be deemed to be, separate and independent of, and not dependent on, any other covenant contained in this Agreement.

37. Partial Invalidity

If any part of this Agreement is held invalid or unenforceable, the remainder of this Agreement shall not be affected and shall be valid and enforced to the fullest extent permitted by law.

38. Waiver Not Continuing

The waiver by any party hereto of any breach of any provision of this Agreement by any other party hereto, whether such waiver be expressed or implied, shall not be construed to be a continuing waiver or a waiver of, or consent to, any subsequent or prior breach on the part of such other party, of the same or any other provision of this Agreement.

39. Remedies Cumulative; Equitable Relief

Except as otherwise expressly provided in subsections B and D of Section 13 of this Agreement, no remedy conferred by this Agreement upon or reserved to the United States or to Permittees is intended to be exclusive of any other remedy provided for by this Agreement or by law, but each shall be cumulative and shall be in addition to every other remedy given hereunder or now or hereafter existing in equity or at law; and the United States, in a proper action instituted by it, may seek a decree against a Permittee or Permittees for specific performance, injunctive or other equitable relief, as may be appropriate.

40. Section Headings

The section headings in this Agreement are for convenience only, and do not purport to, and shall not be deemed to, define, limit or extend the scope or intent of the section to which they pertain.

41. Authority to Enter Agreement

Each Original Permittee represents and warrants to the United States that: (1) it is duly authorized and empowered under the applicable laws of the State of its incorporation and by its charter and by-laws to enter into and perform this Agreement in accordance with the provisions hereof; (2) its board of directors, or duly authorized executive committee, has duly approved, and has duly authorized, the execution, delivery and performance by it of this Agreement; (3) all corporate and shareholder action that may be necessary or incidental to the approval of this Agreement, and the due execution, delivery and performance hereof by Permittee, has been taken; and (4) that all of the foregoing approvals, authorizations and actions are in full force and effect at the time of the execution and delivery of this Agreement.

IN WITNESS WHEREOF, the parties hereto have duly executed this Agreement as of the date first above written.

UNITED STATES OF AMERICA
By /s/ ROGERS C. B. MORTON
Secretary of the Interior

AMERADA HESS CORPORATION
By /s/ BERNARD T. DEVERIN
Senior Vice President

ARCO Pipe Line Company
By /s/ C. T. Carter
President

Exxon Pipeline Company
By /s/ W. S. Spangler
President

Mobil Alaska Pipeline Company
By /s/ E. J. Wacker, Jr.
Vice President

Phillips Petroleum Company
By /s/ Carstens Slack
Vice President

Sohio Pipe Line Company
By /s/ Allen D. Dorris
President

Union Alaska Pipeline Company
By /s/ Sam A. Snyder
Vice President

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EXHIBIT A

List of Applications and Accompanying Alignment Map and Site Location Drawings Identifying the General Route of the Pipeline

A. The general route of the Pipeline is identified in the following applications, alignment map and site location drawings, filed with the Bureau of Land Management:

(1) Alignment of the centerline of the line pipe—

(a) *Applications*
BLM serial numbers
AA–5847—sheets 1 to 26 inclusive
F–12505—sheets 26 to 138 inclusive

(b) *Description of Alignment Map*
Alyeska Pipeline Service Company
Trans Alaska Pipeline System
Dwg. No. AL—00—G2
Sheets 1–138, inclusive (143 sheets in all, including 25A, 36A, 53A, 114A and 119A)
Prudhoe Bay to Valdez
48″ Oil Pipeline Alignment Map
Scale: 1″ = 1,000′

(c) *Date of Survey*
Engineer's Statement attached to Sheet 1 indicates that survey was made commencing August 19, 1970 through February 16, 1973 (and continuing as minor realignments occur) and that such survey is accurately represented upon the aforesaid sheets of the map with certain exceptions that are noted on individual engineer's statements.

(d) *Date Alignment Map was filed*
September 19, 1973

(e) *BLM office where filed*
Alaska State Office
Bureau of Land Management
555 Cordova Street
Anchorage, Alaska

(2) Locations of certain Related Facilities—

Related facility	Applications BLM serial #	Alyeska site location drawing #	Drawing date
(a) Pump Stations:			
#2	F–15422	D–32–L 500	1–12–72
#3	F–15424	D–33–L–500	1–12–72
#4	F–15426	D–34–L 500	1–12–72
#5	F–15428	D–35–L 500	1–12–72
#6	F–15430	D–36–L 501	1–12–72
#7	F–15432	D–37–L 502	1–12–72
#8	F–15434	D–38–L 501	1–12–72
#10	F–15436	D–40–L 500	1–12–72
#11	AA–6990	D–41–L 500	1–12–72
#12	AA–6991	D–42–L 500	1–12–72
(b) Mechanical Refrigeration Equipment Sites:			
#1		D–00–L 96	No Date
#2		D–00–L 97	No Date
#3		D–00–L 98	No Date
#4		D–00–L 99	No Date
#5		D–00–L 100	No Date
#6		D–00–L 101	No Date

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Related facility	Applications BLM serial #	Alyeska site location drawing #	Drawing date
(b) Mechanical Refrigeration Equipment Sites—Continued			
#7		D–00–L 102	No Date
#8		D–00–L 103	No Date
#9		D–00–L 104	No Date
(c) Pump Station Communication Sites:			
#2	F–15423	D–32–L 501	1–12–72
#3	F–15425	D–33–L 501	1–12–72
#4	F–15427	D–34–L 501	1–12–72
#5	F–15429	D–35–L 501	1–12–72
#6	F–15431	D–36–L 502	1–12–72
#7	F–15433	D–37–L 503	8–29–72
#8	F–15435	D–38–L 502	1–12–72
#10	F–15437	D–40–L 501	1–12–72
#11	AA–6992	D–41–L 501	1–12–72
#12	AA–6993	D–42–L 501	1–12–72
(d) Basic Communication Sites:			
Valdez Terminal		D–60–L 559	12–17–73
Keystone		D–60–L 511	6–22–73
Ptarmigan		D–60–L 540	11–3–73
Tsina		D–60–L 513	6–22–73
Tiekel		D–60–L 541	11–5–73
PS No. 12 Passive		D–60–L 543	11–5–73
Kinball		D–60–L 542	11–5–73
Stuck		D–60–L 544	11–5–73
Gakona		D–60–L 516	6–22–73
Round Top		D–60–L 545	11–3–73
Yost		D–60–L 546	10–31–73
Nicole Knot		D–60–L 547	11–1–73
Donnelly No. 2		D–60–L 548	11–4–73
Aggie		D–60–L 549	11–3–73
West		D–60–L 522	6–22–73
Livengood		D–60–L 550	11–4–73
Bench		D–60–L 551	11–3–73
Hamlin		D–60–L 524	6–22–73
Fish		D–60–L 552	10–31–73
Eagle		D–60–L 526	6–22–73
Coldfoot		D–60–L 527	6–22–73
Kaanuk		D–60–L 553	11–3–73
Table Mountain		D–60–L 529	6–22–73
Margaret Hill		D–60–L 554	10–26–73
Atigun		D–60–L 555	11–3–73
Twin Glacier		D–60–L 539	6–22–73
Tea Lake		D–60–L 556	11–27–73
Galbraith		D–60–L 557	11–27–73
Slope		D–60–L 535	6–22–73
Costa Hill		D–60–L 558	10–30–73
Franklin Bluffs		D–60–L 537	6–22–73
Stuart		D–60–L 504	6–22–73
Ross Dome	F–12139	D–60–L 560	12–17–73
(e) Remote Control Block Valve Equipment Sites:			
#98		D–00–L 33	5–16–73
#100		D–00–L 31	5–16–73
#101		D–00–L 29	5–16–73
#102		D–00–L 27	5–16–73
#103		D–00–L 25	5–16–73
#104		D–00–L 23	5–16–73

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Related facility	Applications BLM serial #	Alyeska site location drawing #	Drawing date
(e) Remote Control Block Valve Equipment Sites—Continued			
#109		D–00–L 21	5–16–73
#113		D–00–L 19	5–16–73
#115		D–00–L 17	5–16–73
#116		D–00–L 15	5–16–73
#117		D–00–L 13	5–16–73
#118		D–00–L 11	5–16–73
#119		D–00–L 9	5–16–73
#123		D–00–L 7	5–17–73
#125		D–00–L 5	5–17–73
#51		D–00–L 65	5–16–73
#53		D–00–L 63	5–16–73
#54		D–00–L 61	5–16–73
#56		D–00–L 59	5–16–73
#58		D–00–L 55	5–16–73
#57		D–00–L 57	5–16–73
#59		D–00–L 53	5–16–73
#60		D–00–L 51	5–16–73
#62		D–00–L 49	5–16–73
#65		D–00–L 47	5–16–73
#67		D–00–L 45	5–16–73
#68		D–00–L 43	5–16–73
#88		D–00–L 41	5–16–73
#91		D–00–L 39	5–16–73
#96		D–00–L 37	5–16–73
#97		D–00–L 35	5–16–73
#31		D–00–L 95	5–16–73
#32		D–00–L 93	5–16–73
#33		D–00–L 91	5–16–73
#34		D–00–L 89	5–16–73
#35		D–00–L 87	5–16–73
#36		D–00–L 85	5–16–73
#37		D–00–L 83	5–16–73
#39		D–00–L 81	5–16–73
#40		D–00–L 79	5–16–73
#42		D–00–L 77	5–16–73
#43		D–00–L 75	5–16–73
#44		D–00–L 73	5–16–73
#45		D–00–L 71	5–16–73
#47		D–00–L 69	5–16–73
#49		D–00–L 67	5–16–73
(f) Communication Facilities at Valve Sites:			
#31	F–19621	D–00–L 94	No Date
#32	F–19622	D–00–L 92	No Date
#33	F–19623	D–00–L 90	No Date
#34	F–19624	D–00–L 88	No Date
#35	F–19625	D–00–L 86	No Date
#36	F–19626	D–00–L 84	No Date
#37	F–19627	D–00–L 82	No Date
#39	F–19628	D–00–L 80	No Date
#40	F–19629	D–00–L 78	No Date
#42	F–19630	D–00–L 76	No Date
#43	F–19631	D–00–L 74	No Date
#44	F–19632	D–00–L 72	No Date
#45	F–19633	D–00–L 70	No Date
#47	F–19634	D–00–L 68	No Date

Related facility	Applications BLM serial #	Alyeska site location drawing #	Drawing date
(f) Communication Facilities at Valve Sites—Continued			
#49	F–19635	D–00–L 66	No Date
#51	F–19636	D–00–L 64	No Date
#53	F–19637	D–00–L 62	No Date
#54	F–19638	D–00–L 60	No Date
#56	F–19639	D–00–L 58	No Date
#57	F–19640	D–00–L 56	No Date
#58	F–19641	D–00–L 54	No Date
#59	F–19642	D–00–L 52	No Date
#60	F–19643	D–00–L 50	No Date
#62	F–19644	D–00–L 48	No Date
#65	F–19645	D–00–L 46	No Date
#67	F–19646	D–00–L 44	No Date
#68	F–19647	D–00–L 42	No Date
#88	F–19648	D–00–L 40	No Date
#91	F–19649	D–00–L 38	No Date
#96	F–19650	D–00–L 36	No Date
#97	F–19651	D–00–L 34	No Date
#98	F–19652	D–00–L 32	No Date
#100	AA–8499	D–00–L 30	No Date
#101	AA–8500	D–00–L 28	No Date
#102	AA–8501	D–00–L 26	No Date
#103	AA–8502	D–00–L 24	No Date
#104	AA–8503	D–00–L 22	No Date
#109	AA–8504	D–00–L 20	No Date
#113	AA–8505	D–00–L 18	No Date
#115	AA–8506	D–00–L 16	No Date
#116	AA–8507	D–00–L 14	No Date
#117	AA–8508	D–00–L 12	No Date
#118	AA–8509	D–00–L 10	No Date
#119	AA–8510	D–00–L 8	No Date
#123	AA–8511	D–00–L 6	No Date
#125	AA–8512	D–00–L 4	No Date
(g) Erosion Control Structure Sites:			
Unnamed Creek		C–00–L 1041	8–31–73
Brown Creek		C–00–L 1042	8–31–73
Lowe River		C–00–L 1043	8–31–73
Sheep Creek		C–00–L 1044	8–31–73
Tsina River #1		C–00–L 1045	8–31–73
Tsina River #1		C–00–L 1046	8–31–73
Tsina River #3		C–00–L 1047	8–31–73
Tiekel River #1		C–00–L 1048	8–31–73
Tiekel River #3		C–00–L 1049	8–31–73
Tiekel River		C–00–L 1050	8–31–73
McCallum Creek		C–00–L 1051	8–31–73
Phelan Creek		C–00–L 1052	8–31–73
Phelan Creek #2		C–00–L 1053	8–31–73
Phelan Creek #2		C–00–L 1054	8–31–73
Phelan Creek #2		C–00–L 1055	8–31–73
Phelan Creek #2		C–00–L 1056	8–31–73
Phelan Creek #2		C–00–L 1057	8–31–73
Phelan Creek		C–00–L 1058	8–31–73
Phelan Creek		C–00–L 1059	8–31–73
Phelan Creek #2		C–00–L 1060	8–31–73
Phelan Creek #2		C–00–L 1061	8–31–73
Phelan Creek		C–00–L 1062	8–31–73

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Related facility	Applications BLM serial #	Alyeska site location drawing #	Drawing date
(g) Erosion Control Structure Sites—Continued			
Phelan Creek		C–00–L 1063	8–31–73
Phelan Creek		C–00–L 1064	8–31–73
Phelan Creek		C–00–L 1065	8–31–73
Phelan Creek		C–00–L 1066	8–31–73
Delta River #1		C–00–L 1067	8–31–73
Delta River #1		C–00–L 1068	8–31–73
Delta River #1		C–00–L 1069	8–31–73
Delta River #1		C–00–L 1070	8–31–73
Delta River #1		C–00–L 1071	8–31–73
Delta River #2		C–00–L 1072	8–31–73
Delta River #2		C–00–L 1073	8–31–73
Delta River #2		C–00–L 1074	8–31–73
Delta River #2		C–00–L 1075	8–31–73
Delta River #2		C–00–L 1076	8–31–73
Delta River #3		C–00–L 1077	8–31–73
Delta River #3		C–00–L 1078	8–31–73
Delta River #3		C–00–L 1079	8–31–73
Delta River #3		C–00–L 1080	8–31–73
Delta River #3		C–00–L 1081	8–31–73
Delta River #3		C–00–L 1082	8–31–73
Delta River #3		C–00–L 1083	8–31–73
Delta River #3		C–00–L 1084	8–31–73
Trims Creek		C–00–L 1085	8–31–73
Boulder Creek		C–00–L 1086	8–31–73
Lower Suzy-Q Creek		C–00–L 1087	8–31–73
Darling Creek		C–00–L 1088	8–31–73
N. Fork Bonanza		C–00–L 1090	8–31–73
Jim River		C–00–L 1091	8–31–73
Jim River		C–00–L 1092	8–31–73
S. Fork Koyukuk		C–00–L 1093	8–31–73
Middle Fork Koyukuk		C–00–L 1094	8–31–73
Middle Fork Koyukuk		C–00–L 1095	8–31–73
Middle Fork Koyukuk		C–00–L 1096	8–31–73
Middle Fork Koyukuk		C–00–L 1097	8–31–73
Middle Fork Koyukuk		C–00–L 1098	8–31–73
Middle Fork Koyukuk		C–00–L 1099	8–31–73
Middle Fork Koyukuk		C–00–L 1100	8–31–73
Middle Fork Koyukuk		C–00–L 1101	8–31–73
Dietrich River		C–00–L 1102	8–31–73
Dietrich River		C–00–L 1103	8–31–73
Dietrich River		C–00–L 1104	8–31–73
Dietrich River		C–00–L 1105	8–31–73
Sagavanirktok River		C–00–L 1106	8–31–73
Sagavanirktok River		C–00–L 1107	8–31–73
Sagavanirktok River		C–00–L 1108	8–31–73
Sagavanirktok River		C–00–L 1109	8–31–73
Sagavanirktok River		C–00–L 1110	8–31–73
Sagavanirktok River		C–00–L 1111	8–31–73
Sagavanirktok River		C–00–L 1112	8–31–73
Sagavanirktok River		C–00–L 1113	8–31–73
Sagavanirktok River		C–00–L 1114	8–31–73
Sagavanirktok River		C–00–L 1115	8–31–73
Sagavanirktok River		C–00–L 1116	8–31–73
(h) Valdez Terminal Site			
Valdez Terminal Site	AA–5847	X–50–L–501	12–10–73

B. The provisions of subsection A above in this Exhibit are subject to the following:

(1) All alignments, boundaries, sites and proposed improvements that may be described or depicted in any application, map or drawing referred to above are subject to the written approval of the Secretary or Authorized Officer, in accordance with the provisions of this Agreement, and the inclusion of a particular type of Related Facility does not necessarily connote approval by the Secretary or the Authorized Officer of any concept, mode or design with respect to the facility.

(2) Any conflict, either expressed or implied, between any provision of this Exhibit (or of any application, map, drawing, or other document filed with or in support of the application, map or drawing), on the one hand, and, on the other hand, any provision found elsewhere in this Agreement, shall be resolved in favor of the provision found elsewhere in this Agreement.

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EXHIBIT B

Requirements of the Department of Defense Relating to Military Installations

A. General Requirements

1. Entry upon military land for construction and routine operations and maintenance shall be fully coordinated ten (10) days in advance of entry with the appropriate installation commander having immediate jurisdiction over the property. Entry under emergency conditions shall be coordinated expeditiously with the installation commander.

2. Entry for all activities conducted by Permittees upon all military installations shall be in strict compliance with post/base regulations, both existing or hereafter promulgated. Permittees shall obtain copies of such regulations from the affected installation commanders.

3. Ingress and egress to military installations shall be confined to routes designated by the installation commander. Such commander shall have the right to modify or change the designated routes without advance notice to Permittees. Use of existing military roads or other access routes across subject lands shall be non-exclusive.

4. Permittees shall reimburse the United States, through the Army or Air Force installation affected, for any increased maintenance costs of existing military roads resulting from or attributable to usage by Permittees. These costs shall be in addition to those contemplated by Section 12 of this Agreement.

5. Permittees may construct permanent access and maintenance roads within the Right-of-Way, provided such roads do not interfere with the surface use of the area by the military, except during the construction phase.

6. Roads designated by the installation commander to require intermittent military usage may be closed. The installation commander shall approve in advance all such closures. Any extended closure shall cause the road to be treated as stated in Section 3 of these General Requirements.

7. Any overhead construction relating to the Pipeline shall provide for a minimum of eighteen (18) feet of clearance above the existing road surface.

8. Crossover road ramp construction relative to ramp grades, pipeline cover, sleeves, bridging, signs and the like will conform to the extent practical to the standards of the Alaska State Highway Department.

9. Final route selection, as mapped, and any subsequent changes thereto across military lands will be approved by the affected installation commander prior to construction. The route of the Pipeline shall be located so as to avoid military improvements and the Pipeline shall be constructed a minimum distance of three hundred and twenty-five (325) feet from perimeter fences surrounding ammunition and fuel storage areas.

10. No surface projection of the Pipeline shall be permitted within the drop zone area west of the main development at Fort Greely.

11. Crossing of Army Petroleum Oil and Lubricant (POL) lines will be coordinated with the affected installation commander and the Petroleum Distribution Office (PDO), Support Command, U.S. Army, Alaska (USARAL), Fort Richardson, Alaska.

12. The Pipeline traversing subject lands shall be buried from stations 8400+00 and to 8511+51 and from Stations 8554+70 to 8562+46 as shown on Alyeska Pipeline Service Company Trans Alaska Pipeline System Drawing AL–00–G2, Sheet 45 of 138, Prudhoe Bay to Valdez. Burial depth and technique shall be sufficient to permit surface crossing of the Right-of-Way by heavy tracked and wheeled vehicles at designated locations of existing roads and runways. In the event

that subsurface construction cannot be accomplished to the satisfaction of the installation commander, the Pipeline shall be relocated to an area or areas where burial is permissible, or where surface construction can be authorized without interruption of the military mission. Mode of construction between the aforementioned stations shall require the prior consent of the installation commander.

13. Disruption of, or interference with the operation and maintenance of any military pipelines, utility and communication lines is prohibited except by authorization by the installation commander. The Pipeline shall cross all existing intersecting pipelines, conduits, and cables with a minimum clearance of twelve (12) inches.

14. Maximum length of open trench or trenches during construction of the Pipeline over and across the subject land shall not exceed one (1) mile at any given time without the prior approval of the installation commander.

15. Suitable bridged crossings over open trenches shall be provided and maintained where necessary to permit passage of military personnel and vehicles; timely notice of requirements to be furnished by installation commander.

16. In connection with Permittees' duties to repair, replace, and rehabilitate as provided for in Section 13 of this Agreement, where borrowed soil material is necessary to perform such duties, the location and method of obtaining the borrowed material shall be approved by the installation commander. All surplus material not required for fill, backfill or grading shall be spread and leveled in an area designated by said commander.

17. Permittees shall submit legal descriptions of the centerline of the Right-of-Way and permanent access and maintenance roads as constructed in, upon, over and across military-controlled lands to the installation commander within ninety (90) days of the completion of construction within a given military installation. Separate legal descriptions shall be written for each noncontiguous tract of military-controlled land. Said legal descriptions shall be accompanied by preliminary "as built" drawings (and final "as built" drawings shall be furnished within three hundred and sixty (360) days) of said completion of the Pipeline and all permanent access and maintenance roads, together with separate real estate maps in the event sufficient survey information necessary to verify legal descriptions is not contained on the "as built" drawings.

18. Permittees shall install mainline valves sufficient to control Oil flow in the vicinity of populated areas, ammunition/explosive and fuel storage areas.

19. Electrically operated devices installed as part of the Pipeline System which are capable of producing radiations, electomagnetic or other interference, shall be screened, filtered or otherwise suppressed to the extent that such devices will not adversely affect the function of existing communication systems. In the event that physical obstructions, such as towers or buildings are to be erected as part of the Pipeline System, their positioning shall be such that they will not obstruct radiation patterns of line-of-site communication, navigation aids or other communications, electronic or meterological services.

20. Entry for construction and routine maintenance upon installations or crossings of utility facilities under the control of or utilized by Air Force Communications System/White Alice will be coordinated at least ten (10) days prior to entry with Alaska Communications Region through Headquarters, Alaskan Air Command, Elmendorf Air Force Base. Entry under emergency conditions will be coordinated expeditiously with the Region.

21. Should the Pipeline cross high voltage power transmission lines on Eielson Air Force Base, adequate precaution to the satisfaction of the installation commander will be taken to insure that excessive sag or accidental power line breakage does not create a safety hazard.

22. In the event unexploded munitions are discovered by Permittees during construction activities, the construction activities shall immediately cease in that area. Permittees shall notify the installation commander who will immediately proceed to dispose of the munitions. Construction shall not proceed until authorized by the installation commander.

23. The United States reserves to itself the right to construct, use and maintain across, over and/or

under the Right-of-Way, oil and sewer lines, and other facilities, in such manner as not to create an unreasonable interference with the use of the Right-of-Way.

24. Any authorized use or occupation of the subject military lands in connection with the construction, operation, maintenance or termination of the Pipeline System shall be subject to such rules and regulations as the installation commanders may from time to time prescribe. The military departments reserve the right to modify or change conditions to protect military interests as circumstances may from time to time warrant.

25. Transportation, storage and use of explosives during construction of the Pipeline System shall be permitted only in conformance with the applicable installation regulations. Permittees shall secure copies of these regulations from the installation commanders. Use of all explosives on military reservations shall be in strict conformance with U.S. Army Corps of Engineers Safety Manual, and Permittees shall secure copies of this manual from the installation commander. At least thirty (30) days in advance of any underwater blasting, Permittees shall submit to the installation commander a plan for such blasting. The plan shall set forth blasting locations, types and amounts of explosives, date or dates of blasting, and the reason for blasting.

26. The use of pesticides and herbicides shall be in accordance with applicable military regulations. An approved list of pesticides and herbicides, together with application constraints shall be obtained from the installation commander.

27. Permittees shall locate and/or install the Pipeline System in such manner so as to preclude the creation of ground fog and/or ice fog conditions which will in any way decrease the operational capability of the air fields located on Eielson Air Force Base, Fort Wainwright and Fort Greely. Studies or other data supporting the location or construction techniques utilized by Permittees to accomplish the requirements of this condition shall be submitted to the installation commander for review and approval thirty (30) days prior to commencement of construction on the lands herein described.

28. Prior to commencement of construction, Permittees shall submit a schedule of their construction activities on the military installation involved. This schedule shall be in such detail as may be required by the installation commander and during the course of construction this schedule shall be updated and resubmitted as may be required by the installation commander.

B. Definitions

As used above, the following terms have the meanings indicated:

1. "Installation Commander": The Commanding Officer of a military installation, e.g., Fort Wainwright, Fort Greely, Eielson Air Force Base.
2. "District Engineer": The District Engineer, U.S. Army Engineer District, Alaska, Anchorage, Alaska.

DEPARTMENT OF THE ARMY,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, D.C., November 23, 1973.

MR. DAVID E. LINDGREN,
Deputy Solicitor,
Department of the Interior,
Washington, D.C.

DEAR MR. LINDGREN: By letter dated 14 November 1973 we furnished you certain provisions to be included in the right-of-way permit for the construction of the Trans-Alaska Pipeline. These provisions protect military interests where the pipeline right-of-way crosses or otherwise affects military installations.

In this letter we reserved the right to make reasonable modifications or changes from time to time. We are furnishing herewith a revision of Exhibit E which clarifies the intent of various paragraphs and eliminates certain paragraphs in which the provision is already adequately covered in the stipulations of the Final Environmental Impact Statement.

It is the intention of the Department of the Army and the Department of the Air Force to permit the construction, operation, maintenance, and termination of the Trans-Alaska

Pipeline in a way that is compatible with both military operations and the Pipeline System, and that the necessary approvals requested by the Pipeline System will not be unreasonably withheld.

Sincerely,

WOODROW BERGE,
Director of Real Estate.

NOTE.—The "revision" referred to above in this letter was modified in certain respects before being incorporated into this Agreement and the Director of Real Estate, D.O.A., Office of Chief of Engineers, has been apprised of the modifications in all material respects.

DEPARTMENT OF THE ARMY,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, D.C., November 14, 1973.

Mr. DAVID E. LINDGREN,
Deputy Solicitor,
Department of the Interior,
Washington, D.C.

DEAR MR. LINDGREN: This refers to our DAEN–CWZ–W letter dated 9 November 1973 concerning review of your 20 July 1973 draft permit on the construction of the Trans-Alaska Pipeline. We indicated then that the permit should contain conditions to protect military interests where the pipeline right-of-way crosses or otherwise affects military installations.

We have prepared and are inclosing a set of such provisions to be incorporated in the draft permit as Exhibit E.

While these conditions are as accurate as we can foresee at this time, military exigencies and local circumstances may require that reasonable modifications or changes be made from time to time and the discretion to make such changes has been reserved in our proposed Exhibit E.

Sincerely,

WOODROW BERGE,
Director of Real Estate.

EXHIBIT C

Requirements of the Federal Power Commission Relating to Power Sites

A. With respect to any Federal Lands that are classified, withdrawn or reserved for power purposes, the grant of the Right-of-Way is, in accordance with the findings of the Federal Power Commission (Docket No. DA–112–Alaska, U.S. Department of the Interior, issued on December 6, 1973), made subject to:

*** * * the retention of prior rights for reservoir or power development, and subject to the condition that in the event the said land is required for such purposes, any improvements or structures placed thereon which shall be found to interfere with such development shall be removed or relocated as may be necessary to eliminate** interference with reservoir or power development at no **cost to the United States, its permittees or licensees.**

B. The Permittees herein shall not be deemed to be "permittees or licensees" within the meaning of the aforesaid findings of the Federal Power Commission.

EXHIBIT D

Stipulations for the Agreement and Grant of Right-of-Way for the Trans-Alaska Pipeline

Table of Contents

1. GENERAL

1.1. Definitions

1.1.1. As used in these Stipulations and elsewhere in this "Agreement and Grant of Right-of-Way for Trans-Alaska Pipeline", the following terms have the following meanings:

1.1.1.1. "Access Roads" means the roads constructed or used by Permittees within, or for ingress to and egress from, the Pipeline System. It does not include the proposed State highway from the Yukon River to Prudhoe Bay, Alaska, or any other State highway.

1.1.1.2. "Affiliate" means (a) a Subsidiary of a Parent, or (b) the Parent of the Subsidiary, or (c) in the case of a corporate Subsidiary, one or more corporations that share the Parent with the Subsidiary by reason of the fact that all of the outstanding capital stock of each of the corporations that share the Parent is owned directly or indirectly by the Parent, or (d) in the case of Sohio Pipe Line Company, any corporation of which all of the outstanding capital stock is owned directly or indirectly by The Standard Oil Company, an Ohio corporation, or The British Petroleum Company, Limited, a United Kingdom corporation, or both.

1.1.1.3. "Authorized Officer" means the employee of the Department, designated by the Secretary, to whom the Secretary delegates the authority to act on behalf of the Secretary pursuant to this Agreement or such other Person to whom the Authorized Officer redelegates his authority pursuant to the delegation of authority to the Authorized Officer from the Secretary.

1.1.1.4. "Business Entity" means an artificial legal entity, formed to conduct one or more ventures for profit, or not for profit, that is duly authorized and empowered to sue and be sued, and to hold the title to property, in its own name.

1.1.1.5. "Category 1(c) Lands" means lands selected by the State and not tentatively approved and not withdrawn under section 11(a)(2) of the Alaska Native Claims Settlement Act.

1.1.1.6. "Category 1(d) Lands" means lands selected by the State and not tentatively approved and which were withdrawn under section 11(a)(2) of the Alaska Native Claims Settlement Act but which are not available for village or regional selection under section 22(1) of the Alaska Native Claims Settlement Act, 85 Stat. 713, 43 U.S.C. § 1621 (1970).

1.1.1.7. "Commissioning" means the acceptance and custody by Permittees of the first Oil tendered for shipment through the Pipeline after provision for line fill and tank bottoms. Permittees shall, by written notice, promptly advise the Authorized Officer of the date upon which such acceptance and custody takes place.

1.1.1.8. "Construction Mode" means the type of construction to be employed generally with regard to the Pipeline (e.g., whether the pipe will be buried or elevated).

1.1.1.9. "Construction Segment" means a portion of the Pipeline System that constitutes a complete physical entity or stage, in and of itself, which can be constructed, independently of any other portion or stage of the Pipeline System, in a designated area or between two given geographical points reasonably proximate to one another. It is not to be construed as referring to the entirety of the Pipeline or of the Pipeline System.

1.1.1.10. "Construction Subdivision" means any one of approximately six (6) large, lineal sections of the route of the Pipeline as determined by the Authorized Officer after consulting with Permittees.

1.1.1.11. "Department" means the Department of the Interior of the United States, or any successor department or agency.

1.1.1.12. "Final Design" comprises completed design documents. It shall include contract plans and specifications; proposed Construction Modes; operational requirements necessary to justify designs; schedules; design analysis (including sample calculations for each particular design feature); all functional and engineering criteria; summaries of tests conducted and their results; and other considerations pertinent to design and project life expectancy.

1.1.1.13. "Involuntary Passage of Title" means a Transfer that is made by the exercise of a power of sale primarily for the benefit of creditors, or in accordance with the judgment, order or decree of a court in bankruptcy, eminent domain or other similar proceedings, or pursuant to any act or resolution of a sovereign legislative body directing a lawful taking of property.

1.1.1.14. "Mapping Segment" means a Construction Subdivision, or any part thereof, as determined by the Authorized Officer; *provided, however*, that with respect to a pump station, basic communication site, remote control valve site, mechanical refrigeration equipment site and

any other like Related Facility, a Mapping Segment means the entire site.

1.1.1.15. "Notice to Proceed" means a permission to initiate Pipeline System construction that is issued in accordance with Stipulation 1.7.

1.1.1.16. "Oil" means unrefined liquid hydrocarbons, including gas liquids.

1.1.1.17. "Parent" means a Person or Business Entity whose direct or indirect legal or beneficial ownership interest in, or with respect to, a Transferee or Permittee enables that Person or Business Entity to control the Transferee's or the Permittee's management or policies.

1.1.1.18. "Permittee" means any one of the Permittees.

1.1.1.19. "Permittees" means the Original Permittees, or their respective successors or assigns holding an undivided ownership interest in the Right-of-Way to the extent sanctioned by the Secretary in accordance with the provisions of this Agreement.

1.1.1.20. "Person" means a natural person.

1.1.1.21. "Persons" means more than one Person.

1.1.1.22. "Pipeline System" means all facilities located in Alaska used by Permittees in connection with the construction, operation, maintenance or termination of the Pipeline. This includes, but is not limited to, the Pipeline, storage tanks, Access Roads, communications sites, airfields, construction camps, materials sites, bridges, construction equipment and facilities at the origin station and at the Valdez terminal. This does not include facilities used in connection with production of oil or gathering systems, nor does it include such things as urban administrative offices and similar facilities which are only indirectly involved.

1.1.1.23. "Preliminary Design" means the establishment of project criteria (i.e., construction, including design, and operational concepts) necessary to delineate the project to be constructed. As a minimum it includes the following: design criteria and project concepts; evaluation of field data used to establish the design criteria; drawings showing functional and technical requirements; reports of all test data compiled during the data collection and preliminary design evaluation; standard drawings (if applicable) or drawings to support structural design concepts of each typical facility or structure; proposed Construction Modes; outline project specifications; sample computations to support the design concepts and bases for project siting.

1.1.1.24. A. "Related Facilities" means those structures, devices, improvements, and sites, the substantially continuous use of which is necessary for the operation or maintenance of the Oil transportation pipeline, including:

(1) line pipe and supporting structures;

(2) pump stations, including associated buildings, heliports, structures, yards and fences;

(3) valves and other control devices, and structures housing them;

(4) monitoring and communications devices, and structures housing them;

(5) surge and storage tanks, and related containment structures;

(6) bridges;

(7) terminals, including associated buildings, heliports, structures, yards, docks, and fences;

(8) a gas fuel line and electrical power lines necessary to serve the Pipeline;

(9) retaining walls, berms, dikes, ditches, cuts and fills, including hydraulic control structures;

(10) storage buildings and structures, and areas for storage of supplies and equipment;

(11) administrative buildings;

(12) cathodic protection devices;

(13) mechanical refrigeration equipment; and

(14) such other facilities as the Authorized Officer shall determine to be Related Facilities.

B. "Related Facilities" not authorized by this Agreement include roads and airports. Authorizations for such Related Facilities shall be given by other instruments.

C. "Related Facilities" does not mean those structures, devices, improvements, sites, facilities or areas, the use of which is temporary in nature such as those used only for construction purposes. Among such are: temporary camps; temporary landing strips; temporary bridges; temporary Access Roads; temporary communications sites; temporary storage sites; disposal sites; and construction use areas.

1.1.1.25. "Secretary" means the Secretary of the Interior of the United States, his delegate or lawful successor.

1.1.1.26. "Secretary of Labor" means the Secretary of Labor of the United States, his delegate or lawful successor.

1.1.1.27. "Subsidiary" means a Business Entity, that may or may not be a Permittee; the management and policies of which are controlled by a Parent directly or indirectly through one or more intermediaries.

1.1.1.28. "Transfer" means the passage of any right, title or interest in property (real, personal or mixed) by sale, grant, assignment, operation of law or otherwise, and whether voluntary or not.

1.1.1.29. "Transferee" means any Person, Business Entity or governmental or quasi-governmental body or authority in which there is, or there is proposed to be, vested any right, title, or interest of a Permittee in the Agreement or the Right-of-Way pursuant to a Transfer.

1.1.1.30. "Transferor" means any Permittee that makes, or that seeks to make, a Transfer of any right, title or interest in this Agreement or the Right-of-Way.

1.1.2. Terms defined elsewhere in this Agreement:

1.2. Responsibilities

1.2.1. Except where the approval of the Authorized Officer is required before Permittees may commence a particular operation, neither the United States nor any of its agents or employees agrees, or is in any way obligated, to examine or review any plan, design, specification, or other document which may be filed with the Authorized Officer by Permittees pursuant to these Stipulations.

1.2.2. The absence of any comment by the Authorized Officer or any other agent or employee or contractor of the United States with respect to any plan, design, specification, or other document which may be filed by Permittees with the Authorized Officer shall not be deemed to represent in any way whatever any assent to, approval of, or concurrence in such plan, design, specification, or other document or of any action proposed therein.

1.2.3. With regard to the construction, operation, maintenance and termination of the Pipeline System: (1) Permittees shall ensure full compliance with the provisions of this Agreement, including these Stipulations, by their agents, employees and contractors (including subcontractors of any tier), and the employees of each of them. (2) Unless clearly inapplicable, the requirements and prohibitions imposed upon Permittees by these Stipulations are also imposed upon each Permittee's agents, employees, contractors, and subcontractors, and the employees of each of them. (3) Failure or refusal of a Permittee's agents, employees, contractors, subcontractors, or their employees to comply with these Stipulations shall be deemed to be the failure or refusal of the Permittee. (4) Each Permittee shall require its agents, contractors and subcontractors to include these Stipulations in all contracts and subcontracts which are entered into by any of them, together with a provision that the other contracting party, together with its agents, employees, contractors and subcontractors, and the employees of each of them, shall likewise be bound to comply with these Stipulations.

1.2.4. Permittees shall make separate application, under applicable statutes and regulations, for authorization to use or occupy Federal Lands in connection with the Pipeline System where the lands are not within the Right-of-Way granted by this Agreement.

1.3. Authorized Officer

1.3.1. For purposes of information and review, the Authorized Officer may call upon Permittees at any time to furnish any or all data related to construction, operation, maintenance and termination activities undertaken in connection with the Pipeline System.

1.3.2. The Authorized Officer may require Permittees to make such modification of the Pipeline System, without liability or expense to the United States, as he deems necessary to: protect or maintain stability of geologic materials; protect or maintain integrity of the Pipeline System; prevent serious and irreparable harm to the environment (including but not limited to fish or wildlife populations, or their habitats) ; or remove hazards to public health and safety.

1.4. Common Agent of Permittees

1.4.1. Permittees, and each of them, have appointed Alyeska Pipeline Service Company as their common agent to design and construct the Pipeline System under and pursuant to an agreement entitled "Agreement for the Design and Construction of the Trans Alaska Pipeline System," dated August 27, 1970, and intend to appoint Alyeska Pipeline Service Company as their common agent to operate, maintain and terminate the Pipeline System under and generally pursuant to an Operating Agreement referred to in Section 5.1 of the "Trans Alaska Pipeline System Agreement," dated August 27, 1970. A Power of Attorney has been filed with the Department of the Interior by each Permittee appointing Alyeska Pipeline Service Company the true and lawful agent and attorney-in-fact on behalf of each Permittee with full power and authority to execute and deliver any and all instruments in connection with the design, construction, or operation of the Pipeline System. Within the scope of such contractual authority, such agent shall represent Permittees, and each of them, with respect to this Agreement. Such agent is and shall be empowered on behalf of Permittees, and each of them, to accept service of any process, pleadings or other documents in connection with any court or administrative proceeding relating in whole or in part to this Agreement or to all or any part of the Pipeline System and to which the United States shall be a party.

1.4.2. Permittees shall maintain a common agent for the construction, operation, maintenance and termination of the Pipeline System at all times during this Agreement. Such agent shall be a citizen of the United States, or if a corporation, a domestic corporation. Such agent shall be a resident of Alaska, or if a corporation, shall be duly authorized to conduct business in Alaska. Permittees shall cause such agent to maintain in the City of Anchorage, Alaska, at all times during this Agreement an office for the delivery of all documents, orders, notices and other written communications, as provided for in Stipulations 1.4.1. and 1.6.

1.4.3. In the event Permittees substitute a new common agent at any time, Permittees shall give prompt written notice to the Authorized Officer of such substitution, the name and office address in Anchorage, Alaska, of the new agent, and a copy of Permittees' agreement with the new agent. The United States shall be entitled to rely on each appointment until such time as a notice of the substitution of a new common agent takes effect. Each such notice shall not take effect until two (2) full working days after (and not including) the date that it was received by the Authorized Officer.

1.4.4. Upon the Transfer by any Permittee of any right, title or interest of Permittee in the Right-of-Way or this Agreement, the Transferee shall promptly execute and deliver to the Authorized Officer such documents as may be required to evidence the Transferee's appointment and ratification of the then-acting common agent.

1.5. Authority of Representatives of Authorized Officer and Common Agent; Orders of Authorized Officer.

1.5.1. No order or notice given to Permittees on behalf of the Secretary by the Authorized Officer or any other Person shall be effective as to Permittees unless prior written notice of the delegation of authority to issue such order or notice has been given to Permittees in the manner provided in Stipulation 1.6.

1.5.2. Permittees shall comply with each and every lawful order directed to them and that is issued by the Secretary, the Authorized Officer or by any duly authorized representative of the Authorized Officer.

1.5.3. Permittees shall cause the common agent of Permittees to maintain a sufficient number of its duly authorized representatives to allow for the prompt delivery to Permittees, or any of them, of all notices, orders and other communications,

written or oral, of the Secretary or Authorized Officer. Each of the said representatives shall be registered with the Authorized Officer, and shall be appropriately identified in such manner and on such terms as the Authorized Officer shall prescribe. Permittees shall cause the common agent of Permittees to consult with the Authorized Officer at any time regarding the number and location of such representatives of the common agent.

1.6. Orders and Notices

1.6.1. All decisions, determinations, authorizations, approvals, consents, demands or directions that shall be made or given by the Secretary or the Authorized Officer to any one or more of Permittees in connection with the enforcement or administration of this Agreement, any applicable law or regulation, or any other agreement, permit or authorization relating in whole or in part to all or any part of the Pipeline System shall, except as otherwise provided in Stipulation 1.6.2. of this Stipulation, be in the form of a written order or notice.

1.6.2. If, in the judgment of the Secretary or the Authorized Officer, there is an emergency that necessitates the immediate issuance to any one or more of Permittees of an order or notice, such order or notice may be given orally, *provided, however*, that subsequent confirmation of the order or notice shall be given in writing as rapidly as is practicable under the circumstances.

1.6.3. All written orders, notices or other written communications, including telegrams, relating to any subject (and regardless of whether they do or do not relate to the design or construction of the Pipeline System) that are addressed to any one or more of Permittees shall be deemed to have been delivered to and received by the addressee or addressees when the order, notice or other communication has been delivered: (1) either by messenger during normal business hours or by means of registered or certified United States mail, postage prepaid, return receipt requested, to the office of the common agent of Permittees at 1815 South Bragaw Street, Anchorage, Alaska 99504, or (2) personally to any authorized representative of the common agent.

1.6.4. All written notices and communications, including telegrams, of any one or more of Permittees that are addressed to the Secretary shall be deemed to have been delivered to and received by the Secretary when the notice or communication has been delivered, either by messenger during normal business hours or by means of registered or certified United States mail, postage prepaid, return receipt requested, to the Secretary personally or to Office Room No. 6151 in the Department of the Interior Building, 18th & C Streets, Northwest, Washington, D.C. 20240.

1.6.5. All written notices and communications of any one or more of Permittees that are addressed to the Authorized Officer shall be deemed to have been delivered and received by the addressee when the notice or communication has been delivered, either by messenger during normal business hours or by means of registered or certified United States mail, postage prepaid, return receipt requested, to the Authorized Officer personally or to Office Room No. 405, 555 Cordova Street, Anchorage, Alaska 99504.

1.6.6. The United States or Permittees, by written notice to the other, may change the office address to which written notices, orders, or other written communications may be addressed and delivered thereafter, subject, however, to the provisions of Stipulation 1.4.

1.6.7. The regulations of the Department relating to notices or other communications by mail (43 CFR 1810.2) shall not be applicable to this Agreement.

1.7. Notices To Proceed

1.7.1. Permission to construct.

1.7.1.1. Permittees shall not initiate any construction of the Pipeline System without prior written permission of the Authorized Officer. Such permission shall be given solely by means of a written Notice to Proceed issued by the Authorized Officer. Each Notice to Proceed shall authorize construction only as therein expressly stated and only for the particular Construction Segment therein described.

1.7.1.2. The Authorized Officer shall issue a Notice to Proceed only when in his judgment the construction (including design) and operation proposals are in conformity with the provisions of these Stipulations.

1.7.1.3. By written notice, the Authorized Officer may revoke in whole or in part any Notice to Proceed which has been issued when in his judgment unforeseen conditions later arising require alterations in the Notice to Proceed in order to: protect or maintain stability of geologic materials; protect or maintain integrity of the Pipeline System; prevent serious and irreparable harm to the

environment (including but not limited to fish or wildlife populations, or their habitats) ; or remove hazards to public health and safety.

1.7.1.4. Prior to submission of any Preliminary Designs or applications for any Notice to Proceed, Permittees and the Authorized Officer shall agree to a schedule for the time, scope and quantity of such submissions and applications. The purpose of such schedule is to assure that Permittees' submissions and applications shall be reasonable in scope, and filed in a reasonable time frame, insofar as the workload thereby imposed on the Authorized Officer is concerned. Submittals and applications shall be filed in accordance with said schedule, and the Authorized Officer may refuse to consider any that are not so filed. The schedule may be reviewed and revised from time to time as may be agreed upon by Permittees and the Authorized Officer.

1.7.2. Preliminary Design Submissions

1.7.2.1. Prior to applying for a Notice to Proceed for any Construction Segment, Permittees shall submit the Preliminary Design for that Segment to the Authorized Officer for approval. Where appropriate, each submission shall include the criteria which justify the selection of the Construction Modes. The Authorized Officer shall expeditiously review each submission and shall do so within thirty (30) days from the date of his receipt of the submission. The Authorized Officer may request additional information if he deems it necessary.

1.7.2.2. In appropriate cases, the Authorized Officer may waive the requirement that a Preliminary Design be submitted. In this circumstance, Permittees may proceed to apply for a Notice to Proceed in accordance with Stipulation 1.7.4.

1.7.3. Summary Network Analysis Diagram

1.7.3.1. Prior to Final Design submissions, Permittees shall submit a summary network analysis diagram for the entire project to the Authorized Officer. The summary network analysis diagram shall be time-scaled and shall include all activities and contingencies which may reasonably be anticipated in connection with the project. The summary network analysis diagram shall include:

(1) Data collection activities;
(2) Submittal and approval activities;
(3) Pre-construction, construction and post-construction activities; and
(4) Other pertinent data.

1.7.3.2. The summary network analysis diagram shall be updated at thirty (30) day intervals, as significant changes occur, or as otherwise approved in writing by the Authorized Officer.

1.7.4. Application for Notice to Proceed

1.7.4.1. Permittees may apply for a Notice to Proceed for only those Construction Segments for which the Preliminary Design has been approved in writing by the Authorized Officer or a waiver pursuant to Stipulation 1.7.2.2 has been issued in writing by the Authorized Officer.

1.7.4.2. Before applying for a Notice to Proceed for a Construction Segment, Permittees shall, in such manner as shall be acceptable to the Authorized Officer, by survey, locate and clearly mark on the ground the proposed centerline of the line pipe to be located in the Mapping Segment within which the Construction Segment is to be constructed and the location of all Related Facilities proposed to be constructed in the Mapping Segment.

1.7.4.3. Each application for a Notice to Proceed shall be supported by:

(1) A Final Design.
(2) All reports and results of environmental studies conducted or considered by Permittees.
(3) All data necessary to demonstrate compliance with the terms and conditions of these Stipulations with respect to that particular Construction Segment.
(4) A detailed network analysis diagram for the Construction Segment, including: Permittees' work schedules; consents, permits or authorizations required by State and Federal agencies and their interrelationships; design and review periods; data collection activities; and construction sequencing. The detailed network analysis diagram shall be updated as required to reflect current status of the project.
(5) A map or maps, prepared in such manner as shall be acceptable to the Authorized Officer, depicting the proposed location in the Mapping Segment within which the Construction Segment is to be constructed of: (1) the boundaries of all contiguous temporary use areas, and (2) all improvements, buried or aboveground, that are to be constructed within the Mapping Segment. The Authorized

Officer shall not issue a Notice to Proceed with construction until he has approved all relevant locations on the ground and temporary boundary markers have been set by Permittees to the satisfaction of the Authorized Officer.

(6) Such other data as may be requested by the Authorized Officer either before submission of the application for a Notice to Proceed or at any time during the review period.

1.7.4.4. During review of an application for a Notice to Proceed, the relevant portion of the route of the Pipeline may be modified by the Authorized Officer, if, in his judgment, environmental conditions or new technological developments warrant the modifications. If, during construction, adverse physical conditions are encountered that were not known to exist, or that were known to exist but their significance was not fully appreciated when the Authorized Officer issued a Notice to Proceed for the portion of the Mapping Segment in which the physical conditions are encountered, the Authorized Officer may authorize deviations from the initially approved location of the Pipeline to another location along the same general route of the Pipeline at the point or points where the physical conditions are encountered, including adequate room for structurally sound transition. A deviation shall not be constructed without the prior written approval of the Authorized Officer and, if so approved, shall conform in all respects to the provisions of the approval.

1.7.4.5. The Authorized Officer shall review each application for a Notice to Proceed and all data submitted in connection therewith within ninety (90) days. Said ninety (90) day period shall begin from the later of the following dates:

(1) Date of receipt by the Authorized Officer of an application for a Notice to Proceed.

(2) Date of receipt by the Authorized Officer of the last submittal of additional data pursuant to this Stipulation.

1.7.4.6. If the Authorized Officer requires Permittees to submit additional data on one or more occasions, the review period shall begin from the date of receipt by the Authorized Officer of the last submittal.

1.8. Changes in Conditions

1.8.1. Unforeseen conditions arising during construction, operation, maintenance or termination of the Pipeline System may make it necessary to revise or amend these Stipulations to control or prevent damage to the environment or hazards to public health and safety. In that event, Permittees and the Authorized Officer shall agree as to what revisions or amendments shall be made. If they are unable to agree, the Secretary shall have final authority to determine the matter.

1.9. Antiquities and Historical Sites

1.9.1. Permittees shall engage an archeologist approved by the Authorized Officer to provide surveillance and inspection of the Pipeline System for archeological values.

1.9.2. If, in connection with any operation under this Agreement, or any other Agreement issued in connection with the Pipeline System, Permittees encounter known or previously unknown paleontological, archeological, or historical sites, Permittees shall immediately notify the Authorized Officer and said archeologist. Permittees' archeologist shall investigate and provide an on-the-ground opinion regarding the protection measures to be undertaken by Permittees. The Authorized Officer may suspend that portion of Permittees' operations necessary to preserve evidence pending investigation of the site.

1.9.3. Six copies of all survey and excavation reports shall be filed with the Authorized Officer.

1.10. Completion of Use

1.10.1. Upon completion of the use of all, or a very substantial part, of the Right-of-Way or other portion of the Pipeline System, Permittees shall promptly remove all improvements and equipment, except as otherwise approved in writing by the Authorized Officer, and shall restore the land to a condition that is satisfactory to the Authorized Officer or at the option of Permittees pay the cost of such removal and restoration. The satisfaction of the Authorized Officer shall be stated in writing. Where approved in writing by the Authorized Officer, buried pipe may be left in place, provided all oil and residue are removed from the pipe and the ends are suitably capped.

1.10.2. All areas that do not constitute all, or a very substantial part of the Right-of-Way or other portion of the Pipeline System, utilized pursuant to authorizations issued in connection with the

Pipeline System, shall be Put-to-Bed by Permittees upon completion of their use unless otherwise directed by the Authorized Officer. Put-to-Bed is used herein to mean that Access Roads, material sites and other areas shall be left in such stabilized condition that erosion will be minimized through the use of adequately designed and constructed waterbars, revegetation and chemical surface control; that culverts and bridges shall be removed by Permittees in a manner satisfactory to the Authorized Officer, and that such roads, sites and areas shall be closed to use. Permittees' rehabilitation plans shall be approved in writing by the Authorized Officer prior to termination of use of any such road, or any part thereof, in accordance with Stipulation 2.12.

1.11. Public Improvements

1.11.1. Permittees shall protect existing telephone, telegraph and transmission lines, roads, trails, fences, ditches and like improvements during construction, operation, maintenance and termination of the Pipeline System. Permittees shall not obstruct any road or trail with logs, slash, or debris. Damage caused by Permittees to public utilities and improvements shall be promptly repaired by Permittees to a condition which is satisfactory to the Authorized Officer.

1.12. Regulation of Public Access

1.12.1. During construction or termination activities, Permittees may regulate or prohibit public access to or upon any Access Road being used for such activity. At all other times, Permittees shall permit free and unrestricted public access to and upon Access Roads, except that with the written consent of the Authorized Officer, Permittees may regulate or prohibit public access and vehicular traffic on Access Roads as required to facilitate operations or to protect the public, wildlife and livestock from hazards associated with operation and maintenance of the Pipeline System. Permittees shall provide appropriate warnings, flagmen, barricades, and other safety measures when Permittees are using Access Roads, or regulating or prohibiting public access to or upon Access Roads.

1.12.2. During construction of the Pipeline System, Permittees shall provide alternative routes for existing roads and trails as determined by the Authorized Officer whether or not these roads or trails are recorded.

1.12.3. Permittees shall make provisions for suitable permanent crossings for the public where the Right-of-Way or Access Roads cross existing roads, foot-trails, winter trails, or other rights-of-way.

1.12.4. After completion of construction of the Pipeline System, and with the concurrence of Permittee, the Authorized Officer may designate areas of the Right-of-Way to which the public shall have free and unrestricted access.

1.13. Electronically Operated Devices

1.13.1. Permittee shall screen, filter, or otherwise suppress any electronically operated devices that are installed as part of the Pipeline System which are capable of producing electromagnetic interference radiations so that such devices will not adversely affect the functioning of existing communications systems or navigational aids. In the event that structures such as towers or buildings are to be erected as a part of the Pipeline System, their positioning shall be such that they will not obstruct radiation patterns of line-of-sight communications systems, navigational aids, or similar systems.

1.14. Camping, Hunting, Fishing and Trapping

1.14.1. Permittees shall post the Right-of-Way against camping, hunting, fishing, trapping and shooting within the Right-of-Way. Permittees shall prohibit their employees, agents, contractors, subcontractors, and their employees, from engaging in such activities.

1.14.2. Permittees shall inform their employees, agents, contractors, subcontractors, and their employees, of applicable laws and regulations relating to hunting, fishing, and trapping.

1.15. Small Craft Passage

1.15.1. The creation of any permanent obstruction to the passage of small craft in streams is prohibited.

1.16. Protection of Survey Monuments

1.16.1. Permittees shall mark and protect all geodetic survey monuments encountered during the construction, operation, maintenance and termination of the Pipeline System. These monuments are not to be disturbed; however, if such a disturbance occurs, the Authorized Officer shall be immediately notified thereof in writing.

1.16.2. If any land survey monuments, corners, or accessories (excluding geodetic survey monuments) are destroyed, obliterated or damaged, Permittees shall employ a qualified land surveyor to reestablish or restore same in accordance with the "Manual of Instruction for the Survey of Pub-

lic Lands" and shall record such survey in the appropriate records. Additional requirements for the protection of monuments, corners, and bearing trees may be prescribed by the Authorized Officer.

1.17. Fire Prevention and Suppression

1.17.1. Permittees shall promptly notify the Authorized Officer and take all measures necessary or appropriate for the prevention and suppression of fires in accordance with 43 CFR 2801.1–5(d). Permittees shall comply with the instructions and directions of the Authorized Officer concerning the use, prevention and suppression of fires. Use of open fires in connection with construction of the Pipeline System is prohibited unless authorized in writing by the Authorized Officer.

1.18. Surveillance and Maintenance

1.18.1. During the construction, operation, maintenance and termination of the Pipeline System, Permittees shall conduct a surveillance and maintenance program applicable to the subarctic and arctic environment. This program shall be designed to: (1) provide for public health and safety; (2) prevent damage to natural resources; (3) prevent erosion; and (4) maintain Pipeline System integrity.

1.18.2. Permittees shall have a communication system that ensures the transmission of information required for the safe operation of the Pipeline System.

1.18.3. Permittees shall maintain complete and up-to-date records on construction, operation, maintenance and termination activities performed in connection with the Pipeline System. Such records shall include surveillance data, leak and break records, necessary operational data, modification records and such other data as the Authorized Officer may require.

1.18.4. Permittees shall provide and maintain Access Roads and airstrips, the number and location of which shall be approved by the Authorized Officer, to ensure that Permittees' maintenance crews and Federal and State representatives shall have continuing access to the Pipeline System.

1.19. Housing and Quarters

1.19.1. Permittees shall furnish, on a reimbursable basis, such representatives of the United States as may be designated by the Authorized Officer with adequate meals, living quarters and office space, reasonable use of Permittees' communications systems, and reasonable surface and air transportation during the construction, operation, maintenance and termination of the Pipeline System. Whenever possible, Permittees shall be notified in writing by the Authorized Officer in advance regarding the number of persons for whom such services and facilities will be required.

1.20. Health and Safety

1.20.1. Permittees shall take all measures necessary to protect the health and safety of all persons affected by their activities performed in connection with the construction, operation, maintenance or termination of the Pipeline System, and shall immediately abate any health or safety hazards. Permittees shall immediately notify the Authorized Officer of all serious accidents which occur in connection with such activities.

1.21. Conduct of Operations

1.21.1. Permittees shall perform all Pipeline System operations in a safe and workmanlike manner so as to ensure the safety and integrity of the Pipeline System, and shall at all times employ and maintain personnel and equipment sufficient for that purpose. Permittees shall immediately notify the Authorized Officer of any condition, problem, malfunction, or other occurrence which in any way threatens the integrity of the Pipeline System.

1.22. Applicability of Stipulations

1.22.1. Nothing in these Stipulations shall be construed as applying to activities of Permittees that have no relation to the Pipeline System.

1.22.2. Nothing in these Stipulations shall be construed to affect any right or cause of action that otherwise would be available to Permittees against any person other than the United States.

2. ENVIRONMENTAL

2.1. Environmental Briefing

2.1.1. Prior to, and during, construction of the Pipeline System, Permittees shall provide for environmental and other pertinent briefings for construction and other personnel by such Federal employees as may be designated by the Authorized Officer. Permittees shall arrange the time, place and attendance for such briefings upon request by the Authorized Officer. Permittees shall bear all costs of such briefings other than salary, per diem, subsistence, and travel costs of Federal employees. In addition, Permittees shall separately arrange with the State of Alaska for such similar briefings as the State may desire.

2.2. Pollution Control

2.2.1. General

2.2.1.1. Permittees shall conduct all activities associated with the Pipeline System in a manner that will avoid or minimize degradation of air, land and water quality. In the construction, operation, maintenance and termination of the Pipeline System, Permittees shall perform their activities in accordance with applicable air and water quality standards, related facility siting standards, and related plans of implementation, including but not limited to standards adopted pursuant to the Clean Air Act, as amended, 42 U.S.C. § 1857 *et seq.*, and the Federal Water Pollution Control Act, as amended, 33 U.S.C. § 1321 *et seq.*

2.2.2. Water and Land Pollution

2.2.2.1. Permittees shall comply with applicable "Water Quality Standards" of the State of Alaska as approved by the Environmental Protection Agency.

2.2.2.2. Mobile ground equipment shall not be operated in lakes, streams or rivers unless such operation is approved in writing by the Authorized Officer.

2.2.3. Thermal Pollution

2.2.3.1. Permittees shall comply with the standards set for thermal pollution in the State of Alaska "Water Quality Standards," as approved by the Environmental Protection Agency.

2.2.4. Air Pollution and Ice Fog

2.2.4.1. Permittees shall utilize and operate all facilities and devices used in connection with the Pipeline System so as to avoid or minimize air pollution and ice fog. Facilities and devices which cannot be prevented from producing ice fog shall be located so as not to interfere with airfields, communities or roads.

2.2.4.2. Emissions from equipment, installations and burning materials shall meet applicable Federal and State air quality standards.

2.2.5. Pesticides, Herbicides and other Chemicals

2.2.5.1. Permittees shall use only non-persistent and immobile types of pesticides, herbicides and other chemicals. Each chemical to be used and its application constraint shall be approved in writing by the Authorized Officer prior to use.

2.2.6. Sanitation and Waste Disposal

2.2.6.1. "Waste" means all discarded matter, including but not limited to human waste, trash, garbage, refuse, oil drums, petroleum products, ashes and equipment.

2.2.6.2. All waste generated in construction, operation, maintenance and termination of the Pipeline System shall be removed or otherwise disposed of in a manner acceptable to the Authorized Officer. All applicable standards and guidelines of the Alaska State Department of Environmental Conservation, the United States Public Health Service, the Environmental Protection Agency, and other Federal and State agencies shall be adhered to by Permittees. All incinerators shall meet the requirements of applicable Federal and State laws and regulations and shall be used with maximum precautions to prevent forest and tundra fires. After incineration, material not consumed in the incinerator shall be disposed of in a manner approved in writing by the Authorized Officer. Portable or permanent waste disposal systems to be used shall be approved in writing by the Authorized Officer.

2.3. Buffer Strips

2.3.1. Public Interest Areas

2.3.1.1. No construction activity in connection with the Pipeline System shall be conducted within one-half (½) mile of any officially designated Federal, State or municipal park, wildlife refuge, research natural area, recreation area, recreation site, or any registered National Historic Site or National Landmark, unless such activity is approved in writing by the Authorized Officer.

2.3.2. Vegetative Screen

2.3.2.1. Permittees shall not cut or remove any vegetative cover within a minimum five hundred (500) foot strip between State highways and material sites unless such cutting or removal is approved in writing by the Authorized Officer.

2.3.2.2. Where the Right-of-way crosses State highways, a screen of vegetation native to the specific setting shall be established over disturbed areas unless otherwise approved in writing by the Authorized Officer.

2.3.3. Streams

2.3.3.1. The Pipeline System shall be located so as to provide three hundred (300) foot minimum buffer strips of undisturbed land along streams unless otherwise approved in writing by the Authorized Officer.

2.4. Erosion Control

2.4.1. General

2.4.1.1. Permittees shall perform all Pipeline System construction, operation, maintenance and termination activities so as to avoid or minimize disturbance to vegetation.

2.4.1.2. The design of the Pipeline System shall provide for the construction of control facilities that will avoid or minimize erosion.

2.4.1.3. The erosion control facilities shall be constructed to avoid induced and accelerated erosion and to lessen the possibility of forming new drainage channels resulting from Pipeline System activities. The facilities shall be designed and operations conducted in such a way as to avoid or minimize disturbance to the thermal regime.

2.4.2. Stabilization

2.4.2.1. Surface materials taken from disturbed areas shall be stockpiled and utilized during restoration unless otherwise approved in writing by the Authorized Officer. Stabilization practices, as determined by the needs for specific sites, shall include but shall not be limited to seeding, planting, mulching, and the placement of mat binders, soil binders, rock or gravel blankets, or structures.

2.4.2.2. All disturbed areas shall be left in a stabilized condition satisfactory to the Authorized Officer. Such satisfaction shall be stated in writing by the Authorized Officer.

2.4.3. Crossing of Streams, Rivers or Flood Plains

2.4.3.1. Permittees shall prevent or minimize erosion at stream and river crossings and those parts of the Pipeline System within flood plains, as defined in Stipulation 3.6.

2.4.3.2. Temporary access over stream banks shall be made through use of fill ramps rather than by cutting through stream banks, unless otherwise approved in writing by the Authorized Officer. Permittees shall remove such ramps upon termination of seasonal or final use. Ramp materials shall be disposed of in a manner approved in writing by the Authorized Officer.

2.4.4. Seeding and Planting.

2.4.4.1. Seeding and planting of disturbed areas shall be conducted as soon as practicable and, if necessary, shall be repeated until vegetation is successful, unless otherwise approved in writing by the Authorized Officer. All other restoration shall be completed as soon as possible.

2.4.5. Excavated Material

2.4.5.1. Excavated material in excess of that required to backfill around any structure, including the pipe, shall be disposed of in a manner approved in writing by the Authorized Officer.

2.5. Fish and Wildlife Protection

2.5.1. Passage of Fish

2.5.1.1. Permittees shall provide for uninterrupted movement and safe passage of fish. Any artificial structure or any stream channel change that would cause a blockage to fish shall be provided with a fish passage structure or facility that meets all Federal and State requirements. The proposed design shall be submitted to the Authorized Officer in accordance with Stipulation 1.7.

2.5.1.2. Pump intakes shall be screened to prevent harm to fish.

2.5.1.3. Abandoned water diversion structures shall be plugged and stabilized to prevent trapping or stranding of fish.

2.5.1.4. If material sites are approved adjacent to or in certain lakes, rivers, or streams, the Authorized Officer may require Permittees to construct levees, berms or other suitable means to protect fish and fish passage and to prevent siltation of streams or lakes.

2.5.2. Fish Spawning Beds

2.5.2.1. "Fish Spawning Beds" means the areas where anadromous and resident fish deposit their eggs.

2.5.2.2. Permittees shall avoid channel changes in Fish Spawning Beds designated by the Authorized Officer; however, where channel changes cannot be avoided in such beds, new channels shall be constructed according to written standards supplied by the Authorized Officer.

2.5.2.3. Fish Spawning Beds shall be protected from sediment where soil material is expected to be suspended in water as a result of construction activities. Settling basins shall be constructed to intercept silt before it reaches streams or lakes.

2.5.2.4. Permittees shall comply with any special requirements made by the Authorized Officer for a stream system in order to protect Fish Spawning Beds. Permittees shall repair all damage to Fish Spawning Beds caused by construction, operation, maintenance or termination of the Pipeline System.

2.5.3. Zones of Restricted Activities

2.5.3.1. Permittees' activities in connection with the Pipeline System in key fish and wildlife areas may be restricted by the Authorized Officer during periods of fish and wildlife breeding, nesting, spawning, lambing or calving activity and during major migrations of fish and wildlife. The Authorized Officer shall give Permittees written notice of such restrictive action. From time to time, the Authorized Officer shall furnish Permittees

a list of areas where such actions may be required, together with anticipated dates of restriction.

2.5.4. Big Game Movements

2.5.4.1. Permittees shall construct and maintain the Pipeline, both buried and above ground sections, so as to assure free passage and movement of big game animals.

2.6. Materials Sites

2.6.1. Purchase of Materials

2.6.1.1. If Permittees require materials from the public lands, Permittees shall make application to purchase such materials in accordance with 43 CFR, Part 3610. Permittees shall submit a mining plan in accordance with 43 CFR, Part 23. No materials may be removed by Permittees without the written approval of the Authorized Officer.

2.6.1.2. Insofar as possible, use of existing materials sites will be authorized in preference to new sites.

2.6.1.3. Gravel and other construction materials shall not be taken from stream beds, river beds, lake shores or other outlets of lakes, unless the taking is approved in writing by the Authorized Officer.

2.6.2. Layout of Materials Sites

2.6.2.1. Materials site boundaries shall be shaped in such a manner as to blend with surrounding natural land patterns. Regardless of the layout of materials sites, primary emphasis shall be placed on prevention of soil erosion and damage to vegetation.

2.7. Clearing

2.7.1. Boundaries

2.7.1.1. Permittees shall identify approved clearing boundaries on the ground for each Construction Segment prior to beginning clearing operations. All timber and other vegetative material outside clearing boundaries and all blazed, painted or posted trees which are on or mark clearing boundaries are reserved from cutting and removal with the exception of danger trees or snags designated as such by the Authorized Officer.

2.7.2. Timber

2.7.2.1. Prior to initiating clearing operations, Permittees shall notify the Authorized Officer of the amount of merchantable timber, if any, which will be cut, removed or destroyed in the construction and maintenance of the Pipeline System, and shall pay the United States in advance of such construction or maintenance activity, such sum of money as the Authorized Officer determines to be the full stumpage value of the timber to be cut, removed or destroyed.

2.7.2.2. All trees, snags, and other woody material cut in connection with clearing operations shall be cut so that the resulting stumps shall not be higher than six (6) inches measured from the ground on the uphill side.

2.7.2.3. All trees, snags and other woody material cut in connection with clearing operations shall be felled into the area within the clearing boundaries and away from water courses.

2.7.2.4. Hand clearing shall be used in areas where the Authorized Officer determines that use of heavy equipment would be detrimental to existing conditions.

2.7.2.5. All debris resulting from clearing operations and construction that may block stream flow, delay fish passage, contribute to flood damage, or result in stream bed scour or erosion shall be removed.

2.7.2.6. Logs shall not be skidded or yarded across any stream without the written approval of the Authorized Officer.

2.7.2.7. No log landing shall be located within three-hundred (300) feet of any water course.

2.7.2.8. All slash shall be disposed of in construction pads or Access Roads unless otherwise directed in writing by the Authorized Officer.

2.8. Disturbance of Natural Water

2.8.1. All activities of Permittees in connection with the Pipeline System that may create new lakes, drain existing lakes, significantly divert natural drainages, permanently alter stream hydraulics, or disturb significant areas of stream beds are prohibited unless such activities along with necessary mitigation measures are approved in writing by the Authorized Officer.

2.9. Off Right-of-Way Traffic

2.9.1. Permittees shall not operate mobile ground equipment off the Right-of-Way, Access Roads, State highways, or authorized areas, unless approved in writing by the Authorized Officer or when necessary to prevent harm to any Person.

2.10. Aesthetics

2.10.1. Permittees shall consider aesthetic values in planning, construction and operation of the Pipeline System. Where the Right-of-Way crosses a State highway in forested terrain, the straight length of the Pipeline Right-of-Way visible from the highway shall not exceed six hundred (600) feet in length, unless otherwise approved in writing by the Authorized Officer. The Authorized Of-

ficer may impose such other requirements as he deems necessary to protect aesthetic values.

2.11. Use of Explosives

2.11.1. Permittees shall submit a plan for use of explosives, including but not limited to blasting techniques, to the Authorized Officer in accordance with Stipulation 1.7.

2.11.2. No blasting shall be done under water or within one quarter (¼) mile of streams or lakes without a permit from the Alaska Department of Fish and Game, when such a permit is required by State law or regulation.

2.12. Restoration

2.12.1. Areas disturbed by Permittees shall be restored by Permittees to the satisfaction of the Authorized Officer as stated in writing.

2.12.2. All cut and fill slopes shall be left in a stable condition.

2.12.3. Materials from Access Roads, haul ramps, berms, dikes, and other earthen structures shall be disposed of as directed in writing by the Authorized Officer.

2.12.4. Vegetation, overburden and other materials removed during clearing operations shall be disposed of by Permittees in a manner approved in writing by the Authorized Officer.

2.12.5. Upon completion of restoration, Permittees shall immediately remove all equipment and supplies from the site.

2.13. Reporting of Oil Discharges

2.13.1. A discharge of Oil by Permittees into or upon the navigable waters of the United States, adjoining shorelines, or into or upon the waters of the contiguous zone in violation of the Federal Water Pollution Control Act, as amended, 33 U.S.C. § 1321 *et seq.* and the regulations issued thereunder, or in violation of applicable laws of the State of Alaska and regulations issued thereunder, is prohibited. Permittees shall give immediate notice of any such discharge to: (1) the Authorized Officer; and (2) such other Federal and State officials as are required by law to be given such notice.

2.13.2. Permittees shall give immediate notice of any spill or leakage of Oil or other pollutant from the Pipeline, the Valdez terminal facility, or any storage facility to: (1) the Authorized Officer; and (2) such other Federal and State officials as are required by law to be given such notice. Any oral notice shall be confirmed in writing as soon as possible.

2.14. Contingency Plans

2.14.1. It is the policy of the Department of the Interior that there should be no discharge of Oil or other pollutant into or upon lands or waters. Permittees must therefore recognize their prime responsibility for the protection of the public and environment from the effects of spillage.

2.14.2. Permittees shall submit their contingency plans to the Authorized Officer at least one-hundred and eighty (180) days prior to scheduled start-up. The plans shall conform to this Stipulation and the National Oil Hazardous Substances Pollution Contingency Plan, 36 F.R. 16215, August 20, 1971, and shall: (1) include provisions for Oil Spill Control [1]; (2) specify that the action agencies responsible for contingency plans in Alaska shall be among the first to be notified in the event of any Pipeline System failure resulting in an Oil spill; (3) provide for immediate corrective action including Oil Spill Control and restoration of the affected resource; (4) provide that the Authorized Officer shall approve any materials or devices used for Oil Spill Control and shall approve any disposal sites or techniques selected to handle oily matter; and (5) include separate and specific techniques and schedules for cleanup of Oil spills on land, lakes, rivers and streams, sea. and estuaries.

2.14.3. Prior to Pipeline start-up, such plans shall be approved in writing by the Authorized Officer, and Permittees shall demonstrate their capability and readiness to execute the plans. Permittees shall update as appropriate the plans and methods of implementation thereof, which shall be submitted annually to the Authorized Officer for his written approval.

2.14.4. If during any phase of the construction, operation, maintenance or termination of the Pipeline, any Oil or other pollutant should be discharged from the Pipeline System, the control and total removal, disposal and cleaning up of such Oil or other pollutant, wherever found, shall be the responsibility of Permittees, regardless of fault. Upon failure of Permittees to control, dispose of, or clean up such discharge, the Authorized Officer may take such measures as he deems necessary to control and clean up the discharge

[1] As used in this Stipulation 2.14.2, Oil Spill Control is defined as: (1) detection of the spill; (2) location of the spill; (3) confinement of the spill; and (4) cleanup of the spill.

at the full expense of Permittees. Such action by the Authorized Officer shall not relieve Permittees of any responsibility as provided herein.

3. TECHNICAL

3.1. General

3.1.1. The following standards shall be complied with in design, construction, operation and termination of the Pipeline System.

3.2. Pipeline System Standards

3.2.1. General Standards

3.2.1.1. All design, material and construction, operation, maintenance and termination practices employed in the Pipeline System shall be in accordance with safe and proven engineering practice and shall meet or exceed the following standards:

(1) U.S.A. Standard Code for Pressure Piping, ANSI B 31.4, "Liquid Petroleum Transportation Piping System."

(2) Department of Transportation Regulations, 49 CFR, Part 195, "Transportation of Liqiuds by Pipeline."

(3) ASME Gas Piping Standard Committee, 15 Dec. 1970: "Guide for Gas Transmission and Distribution Piping System."

(4) Department of Transportation Regulations, 49 CFR, Part 192, "Transportation of Natural and Other Gas by Pipelines: Minimum Federal Safety Standards."

3.2.1.2. Requirements in addition to those set forth in the above minimum standards may be imposed by the Authorized Officer as necessary to reflect the impact of subarctic and arctic environments. If any standard contains a provision which is inconsistent with a provision in another standard, the more stringent shall apply.

3.2.2. Special Standards

3.2.2.1. The design shall also provide for remotely controlled shutoff valves at each pump station; remotely controlled mainline block valves (intended to control spills); and additional valves located with the best judgment regarding wildlife habitat, fish habitat, and potentially hazardous areas.

3.2.2.2. All practicable means shall be utilized to minimize injury to the ground organic layer.

3.2.2.3. Radiographic inspection of all main line girth welds and pressure testing of the Pipeline shall be conducted by Permittees prior to placing the system in operation.

3.2.2.4. Permittees shall provide for continuous inspection of Pipeline System construction to ensure compliance with the approved design specifications and these Stipulations.

3.2.2.5. Welder qualification tests shall be by destructive means, except that operators of automatic welding equipment for girth welding of tank seams shall be tested by radiography in accordance with ASME Boiler and Pressure Vessel Code, Section 9, Subsection Q–21(b).

3.2.2.6. Lightning protection shall conform to the requirements of ANSI C5.1—1969, "Lightning Protection Code—1968."

3.2.3. Standards for Access Roads

3.2.3.1. Design, materials and construction practices employed for Access Roads shall be in accordance with safe and proven engineering practice and in accordance with the principles of construction for secondary roads for the subarctic and arctic environments.

3.2.3.2. Permittees shall submit a layout of each proposed Access Road for approval by the Authorized Officer in accordance with Stipulation 1.7.

3.2.3.3. Access Roads shall be constructed to widths suitable for safe operation of equipment at the travel speeds proposed by Permittees.

3.2.3.4. The maximum allowable grade shall be 12 percent unless otherwise approved in writing by the Authorized Officer.

3.3. Construction Mode Requirements

3.3.1. The selection of the Construction Mode (elevated or buried) shall be governed by the following criteria: (1) There shall be an unobstructed air space of at least two feet between the pipe and ground surface; or (2) There shall be no greater heat transfer from the pipe to the ground than results from the use of an unobstructed air space of at least two (2) feet between the pipe and ground surface; or (3) Below the level of the pipe axis the ground shall consist of competent bedrock, soil naturally devoid of permafrost, or if frozen, of Thaw-Stable Sand and Gravel.[2] Above the level of the pipe axis other materials may be present but it must be shown that they will remain stable under all credible conditions; or (4) Results of a detailed field exploration program and analysis indicate that pipe rupture and major terrain

[2] Thaw-Stable Sand and Gravel is defined as material meeting the following requirements: (a) Material lies within the classes GW, GP, SW, and SP, (Unified Soil Classification) but with up to 6% by weight passing the #200 U.S. standard sieve; if an inorganic granular soil contains more than 6% fines than the #200 sieve, its thaw-stability must be justified. (b) There is no excess (segregated or massive) ice. (c) Thawing of the material *in situ* will not result in excess pore-pressure.

disruption will not occur at any place from soil instability. Effects and their interaction, which are to be analyzed on a mile by mile basis to justify the proposed Construction Mode, shall include but not be limited to, thaw plug stability, differential settlement, seismic loading and weakening, and possible movement resulting from slope instability.[3]

As a prerequisite for the use of this criterion, an acceptable comprehensive monitoring system of the Pipeline shall be developed which will include but not be limited to making deformation measurements sufficiently sensitive and prompt to detect the approach to operational tolerance limits (which shall be clearly specified) of the Pipeline; design specifications, operational requirements, and feasibility analysis of such monitoring system shall be submitted in accordance with Stipulation 1.7. Such system shall be operational prior to transmission of Oil through the Pipeline.

3.4. Earthquakes and Fault Displacements

3.4.1. Earthquakes

3.4.1.1. The Pipeline System shall be designed, where technically feasible, by appropriate application of modern, state-of-the-art seismic design procedures to prevent any Oil leakage from the effects (including seismic shaking, ground deformation and earthquake-induced mass movements) of earthquakes distributed along the route as follows:

Zone:	*Richter magnitude*
Valdez to Willow Lake	8.5
Willow Lake to Paxson	7.0
Paxson to Donnelly Dome	8.0
Donnelly Dome to 67 deg. N	7.5
67 deg. N. to Prudhoe Bay	5.5

3.4.1.2. Where such design is not technically feasible, the potential damage from an Oil spill shall be minimized by special design provisions that shall include, but shall not be limited to: (1) a network of ground-motion detectors that continuously monitor, record and instantaneously signal the occurrence of ground motion in the vicinity of the Pipeline reaching the Operational Design Level[4] (the critical levels of ground motions shall be approved in writing by the Authorized Officer); (2) rapid programmed shutdown and prompt close inspection of system integrity in the event of ground motion reaching the Operational Design Level; and (3) a special contingency plan for Oil Spill Control for each such seismically hazardous area which shall be filed in accordance with Stipulation 2.14. This plan shall specifically consider expected field conditions in the particular area in the aftermath of a destructive earthquake.

3.4.2. Fault Displacements

3.4.2.1. Prior to applying for a Notice to Proceed for any Construction Segment, Permittees shall satisfy the Authorized Officer that all recognizable or reasonably inferred faults or fault zones along the alignment within that segment have been identified and delineated, and that the risk of Oil leakage resulting from fault movement and ground deformation has been adequately assessed and provided for in the design of the Pipeline for that segment. Evaluation of said risk shall be based on geologic, geomorphic, geodetic, seismic, and other appropriate scientific evidence of past or present fault behavior and shall be compatible with the design earthquakes tabulated above and with observed relationships between earthquake magnitude and extent and amount of deformation and fault slip within the fault zone.

3.4.2.2. Minimum design criteria for a segment of the Pipeline traversing a fault zone that is reasonably interpreted as active, shall be: (1) that the Pipeline resist failure resulting in leakage from two feet of horizontal and/or vertical displacement in the foundation material anywhere within the fault zone; and (2) that no storage tank or pump station be located within the fault zone.

3.4.2.3. Where the Pipeline crosses a fault or lies within a fault zone that is reasonably interpreted as active, Permittees shall monitor crustal deformation in the vicinity of the Pipeline. Such monitoring shall include annual geodetic observation of permanent reference marks established on stable ground. Said reference marks shall be positioned so as to form closed figures and to provide for detection of relative horizontal and vertical displacements as small as 0.10 ft. across principal individual faults within the fault zone and to provide for monitoring of crustal strain with an absolute error of two parts per million within the fault zone. Further, where annual slip on a fault exceeds 0.10 ft. for two successive years,

[3] Because of soil variability and/or unique hydrologic conditions in active flood plains, some of the requirements of Stipulation 3.3.1 may not be met in those locations. In such cases proposed designs including special design and/or construction procedures where required by these conditions must be submitted with justification to the Authorized Officer for approval in accordance with Stipulation 1.7.

[4] Highest level that would not produce general pipe deformation sufficient to limit operations.

Permittees shall install recording or telemetering slip-meters. Data obtained from the monitoring shall be provided to the Authorized Officer at specified regular intervals throughout the operational life of the Pipeline. Said data shall be used by the Permittees to aid in the initiation of corrective measures to protect the Pipeline from failure caused by tectonic deformation that would result in leakage.

3.5. Slope Stability

3.5.1. Areas subject to mudflows, landslides, avalanches, rock falls and other types of mass movements shall be avoided where practicable in locating the Pipeline. Where such avoidance is not practicable, the Pipeline design, based upon detailed field investigations and analysis, shall provide measures to prevent the occurrence of, or protect the Pipeline against, the effects of mass movements.

3.6. Stream and Flood Plain Crossings and Erosion

3.6.1. General

3.6.1.1. For each region through which the Pipeline passes, the Pipeline shall be designed to withstand or accommodate the effects (including runoff, stream and flood plain erosion, meander cutoffs, lateral migration, ice-jams, and icings) of those meteorologic, hydrologic (including surface and subsurface) and hydraulic conditions considered reasonably possible for the region. The following standards shall apply to such Pipeline design:

3.6.1.1.1. For stream crossings and portions of the Pipeline within the flood plain.

3.6.1.1.1.1. The Pipeline shall cross streams underground unless a different means of crossing is approved in writing by the Authorized Officer.

3.6.1.1.1.2. The design flood shall be based on the concept of the "Standard Project Flood" as defined in Corps of Engineers Bulletin 52–8, Part 1.

3.6.1.1.1.3. The depth of channel scour shall be established by appropriate field investigations and theoretical calculations using those combinations of water velocity and depth that yield the maximum value. At the point of maximum scour, the cover over the pipe shall be at least twenty (20) percent of the computed scour, but not less than four (4) feet.

3.6.1.1.1.4. For overhead crossings comparable analysis shall be made to ensure that support structures are adequately protected from the effects of scour, channel migration, undercutting, ice forces and degradation of permafrost.

3.6.1.1.1.5. In flood plains, appropriate construction procedures shall be used wherever there is potential channelization along the pipe.

3.6.1.1.1.6. The pipe trench excavation shall stop an adequate distance from the water crossing to leave a protective plug (unexcavated material) at each bank. These plugs shall be left in place until the stream bed excavation is complete and the pipe laying operation is begun. The plugs shall not be completely removed until absolutely necessary. The trench shall be backfilled with stable material as soon as the pipe is laid.

3.6.1.2. Culverts and Bridges.

3.6.1.2.1. Culverts and bridges necessary for maintenance of the Pipeline shall be designed to accommodate a fifty (50)-year flood in accordance with criteria established by the American Association of State Highway Officials and the Federal Highway Administration and endorsed by the State of Alaska Department of Highways.

3.6.2. Erosion

3.6.2.1. Where necessary because of outfall erosion, stilling basins shall be constructed at the outflow end of culverts. To prevent erosion the pool sides shall be stabilized by appropriate methods; e.g., by the use of riprap.

3.6.2.2. Slopes of cuts through stream banks shall be designed and constructed to minimize erosion and prevent slides.

3.6.2.3. Erosion control procedures shall accommodate and be based on the runoff produced by the maximum rainfall rate and snow melt rate combination reasonably characteristic of the region. The procedures shall also accommodate effects that result from thawing produced by flowing or ponded water on permafrost terrain.

3.7. Sea Waves

3.7.1. Oil transfer facilities at the Valdez terminal shall be protected by cut-off devices designed and located to prevent major Oil leakage from breaking of pipes by destructive sea waves comparable to those generated in Port Valdez by the March 27, 1964 earthquake. Design for such protective features shall be submitted in accordance with Stipulation 1.7.

3.8. Glacier Surges

3.8.1. Surveillance systems sufficient to give adequate warning of impending surges on any glacier that could damage the Pipeline shall be instituted prior to transmission of Oil through the pipe. Pro-

cedures for initiation and operation of such surveillance systems and protective procedures in the event of such surges shall be submited in accordance with Stipulation 1.7.

3.9. Construction and Operation

3.9.1. All construction, operation, maintenance, and termination activities in connection with the Pipeline System shall be conducted so as to avoid or minimize thermal and other environmental changes and to provide maximum protection to fish and wildlife and their habitat, and people. All working platforms, pads, fills and other surface modifications shall be planned and executed in such a way that any resulting degradation of permafrost will not jeopardize the Pipeline foundations.

3.9.2. Acceptable plans, procedures and quality controls that ensure compliance with Stipulation 3.9.1 shall be submitted in accordance with Stipulation 1.7.

3.10. Pipeline Corrosion

3.10.1. Permittees shall provide detailed plans for corrosion resistant design and methods for early detection of corrosion. These shall include: (1) pipe material and welding techniques to be used and information on their particular suitability for the environment involved; (2) details on the external pipe protection to be provided (coating, wrapping, etc.), including information on variation of the coating process to cope with variations in environmental factors along the Pipeline route; (3) plans for cathodic protection including details of impressed ground sources and controls to ensure continuous maintenance of adequate protection over the entire surface of the pipe; (4) details of plans for monitoring cathodic protection current including spacing of current monitors; (5) provision for periodic intensive surveys of trouble spots, regular preventive maintenance surveys and special provisions for abnormal potential patterns resulting from the crossing of the Pipeline by other pipelines or cables; and (6) information on precautions to be taken to prevent internal corrosion of the Pipeline. Permittees shall also provide for periodic internal pitting surveys by electro-magnetic or other means.

3.11. Containment of Oil Spills

3.11.1. Permittees shall provide Oil spill containment dikes or other structures around storage tanks at pump stations and at the Valdez terminal. The volume of the containment structures shall be at least: (1) one-hundred ten (110) percent of the total storage volume of the storage tanks in the relevant area, plus (2) a volume sufficient for maximum trapped precipitation and runoff which might be impounded at the time of the spill. Such structures shall be constructed to withstand failure from earthquakes in accordance with Stipulation 3.4 and shall be impervious so as to provide seepage-free storage until disposal of their contents can be effected safely without contamination of the surrounding area.

3.11.2. Permittees shall provide containment dikes or other structures to minimize effects of Oil spills at critical locations along the Pipeline in accordance with Stipulation 2.14.

EXHIBIT E
COOPERATIVE AGREEMENT
between
UNITED STATES DEPARTMENT OF THE INTERIOR
and
STATE OF ALASKA
regarding the
PROPOSED TRANS-ALASKA PIPELINE

THIS AGREEMENT, effective this 8th day of January, 1974, by and between the United States Department of the Interior (hereinafter referred to as the "Department") and the State of Alaska (hereinafter referred to as the "State"), which together are hereinafter referred to jointly as "Parties,"

WITNESSETH

WHEREAS, the State has the authority pursuant to AS 38.05.020 to enter into this agreement with the Department in order to protect the lands, waters and natural environment of Alaska;

WHEREAS, the Secretary of the Interior (hereinafter referred to as the "Secretary") has the authority to enter into agreements involving the improvement, management, use and protection of the public lands and their resources pursuant to Section 102 of the Public Land Administration Act, 74 Stat. 506 (1960), 43 U.S.C. § 1363 (1970);

WHEREAS, the Parties have been requested to issue rights-of-way and other authorizations for the construction of an oil pipeline system from Prudhoe Bay to Valdez, Alaska;

WHEREAS, the Congress of the United States has determined that early construction of such an oil pipeline system is in the national interest and has authorized and directed the Secretary and other appropriate Federal officers and agencies to issue and take all necessary action to administer and enforce rights-of-way and other authorizations that are necessary for or related to the construction of the Trans-Alaska oil pipeline system;

WHEREAS, the Legislature of Alaska, in special session, has enacted legislation to establish authority and guidelines for a right-of-way lease for that system;

WHEREAS, the Secretary will designate a Federal Authorized Officer and the Governor of Alaska will appoint a State Pipeline Coordinator who will, respectively, have general supervision and control over the functions in Alaska of the Department and the State with respect to the construction of the pipeline system;

WHEREAS, it is anticipated that detailed technical and environmental stipulations relating to construction of the pipeline system will be incorporated in the right-of-way and other authorizations of each of the Parties, and that the State and Federal stipulations will be similar in all major respects;

WHEREAS, it is necessary to provide for review and approval of designs and surveillance of construction activities in order to assure compliance with the aforesaid stipulations; and

WHEREAS, it is the purpose of this agreement to promote an effective working relationship between the Parties in order to provide maximum

protection for the environment without unnecessary delays in construction of the pipeline system;

NOW, THEREFORE, the Parties agree as follows:

I. LANDS—LEASE AND PERMIT

1. The State and Department recognize the following categories of land to be made subject to the rights-of-way and other authorizations of the State or the Department and that such lands constitute all of the land along the proposed pipeline right-of-way that is not owned by private parties and therefore is subject to the authority of either the Department or the State to authorize rights-of-way.

(a) Lands patented to the State.

(b) Lands selected by and tentatively approved to the State and not withdrawn under section 11(a)(2) of the Alaska Native Claims Settlement Act, 85 Stat. 696, 43 U.S.C. § 1610 (1970).

(c) Lands selected by the State and not tentatively approved and not withdrawn under section 11(a)(2) of the Alaska Native Claims Settlement Act.

(d) Lands selected by the State and not tentatively approved and which were withdrawn under section 11(a)(2) of the Alaska Native Claims Settlement Act but which are not available for village or regional selection under section 22(l) of the Alaska Native Claims Settlement Act, 85 Stat. 713, 43 U.S.C. § 1621 (1970).

(e) Lands selected by the State, both tentatively approved and not tentatively approved, and withdrawn under section 11(a)(2) of the Alaska Native Claims Settlement Act.

(f) Lands beneath navigable waters as defined in Section 2 of the Submerged Lands Act, 67 Stat. 29, 43 U.S.C. § 1301 (1970).

(g) Lands in Federal ownership that have not been selected by the State.

2. The State will issue its right-of-way and other authorizations for lands in categories 1(a), 1(b), and 1(f). The Department will issue its rights-of-way and other authorizations for lands in categories 1(e) and 1(g).

3. Both the State right-of-way lease or other grant and the Federal right-of-way authorization will include the lands in categories 1(c) and 1(d) and each will be effective in accordance with the following terms:

(a) Lands in category 1(c) will be tentatively approved or patented to the State no later than fifteen (15) days after compliance by the Parties with all applicable regulations. The Parties will immediately initiate and expeditiously complete such compliance. The State will thereupon immediately proceed to issue a right-of-way lease or other grant and such authorizations as are necessary for construction and operation of the pipeline system on said lands.

(b) The Department will take all necessary action preparatory to tentatively approving or patenting the lands in category 1(d) to the State within twenty-five (25) days from the effective date of this agreement and will tentatively approve or patent those lands promptly upon receipt of notice from the Commissioner of Natural Resources that the State is prepared to issue a right-of-way lease or other grant and such other authorizations as are necessary for construction and operation of the pipeline system on said lands.

(c) The Federal right-of-way in and to lands in categories 1(c) or 1(d), or both, will vest in the Parties receiving it on the date it is issued by the Department but only upon the occurrence of one of the following events, whichever occurs first:

(i) The Commissioner of Natural Resources notifies the Secretary in writing that it is essential for the expeditious construction of the pipeline system that the Federal right-of-way in and to some or all of the lands in categories 1(c) or 1(d), or both, vest in the Parties receiving it; or

(ii) The lands in category 1(d) have not been tentatively approved to the State and a valid State right-of-way lease or other grant in and to those lands has not been issued for the construction and operation of the pipeline system by March 10, 1974; or

(iii) The lands in category 1(c) have not been tentatively approved to the State and a valid State right-of-way lease or other grant in and to those lands has not been issued for the construction and operation of the pipeline system by June 1, 1974;

Provided as conditions: First, that the Federal right-of-way is made subject to the State's valid pre-existing rights, if any, in and to those lands; Second, that upon either valid tentative approval or valid patent of any of those lands to the State, the existence or subsequent issuance of a valid State right-of-way lease or other grant in and to those lands terminates the Federal right-of-way and other authorizations, and the State right-of-way lease or other grant thereupon applies in all respects to those lands; Third, that the parties who receive the Federal right-of-way and other authorizations agree in writing to the first and second conditions herein and that they will not challenge the validity of the State's right-of-way lease or other grant on the basis of the existence of the Federal right-of-way and other authorizations or their interest therein, and the Federal right-of-way recites these three conditions; and, Fourth, that the Department will make every reasonable effort to tentatively approve and patent the lands to the State expeditiously.

II. SURVEILLANCE

1. While the Parties will establish and maintain separate organizations to assure compliance with the terms and stipulations of their respective right-of-way authorizations and with their respective statutes and regulations, they will seek to coordinate the activities of these organizations as fully as possible. In the execution of their respective responsibilities the Parties will seek to provide maximum protection for the environment without unnecessary delays in construction of the pipeline. Pursuant to this general agreement, it is further agreed that:

(a) The Parties will endeavor, both in central offices and in the field, to locate all personnel in the surveillance effort, including agents and third party contractors, in common locations and to utilize, insofar as possible, common logistical support, with the objective of maximizing communication between the two organizations.

(b) Except as prohibited by law or by the Department's pipeline right-of-way agreement with the owners of the Trans-Alaska pipeline, (but the owners will be required by the State right-of-way lease to make the same available to the State), the Parties will share fully all information concerning the construction of the pipeline system and the surveillance thereof. The State and the Federal organizations will have complete and immediate access to the information of the other, on request, and there will be regular exchange of information regarding design reviews, application for and issuances of notices to proceed, temporary suspension orders, modification orders, reports on compliance in the field, construction change recommendations, all submissions by the holders of the rights-of-way, all third party contractor reports, applications for and issuance of permission to resume activity, and all other similar information. The timing, location, method and type of information exchanged shall be governed by the objective of the fullest possible access to information practical in order to maximize the decision-making capability of the Parties.

(c) The Parties will have full and free access to the lands of each other for all purposes relating to the surveillance of the pipeline system and the enforcement of all State and Federal statutes and regulations.

2. All applications for notices to proceed, together with supporting documents, will be reviewed by both the State Pipeline Coordinator and the Federal Authorized Officer.

The State right-of-way lease will contain provisions regarding notices to proceed that assure review by the Pipeline Coordinator within the same time period as provided in the Department's right-of-way authorizations. The Authorized Officer or his designee, on behalf of the Department, may issue notices to proceed involving construction of any portion of the pipeline system. The Pipeline Coordinator or his designee, on behalf of the State, may issue notices to proceed with respect to any construction of the pipeline system on State lands, and no notice to proceed on lands

subject to the State right-of-way lease will be effective unless signed by the State Pipeline Coordinator.

3. On lands subject to the Federal right-of-way authorizations, the Department will determine compliance with the terms and stipulations regulating the construction of the pipeline system. On lands subject to the Federal right-of-way authorization, where applicable statutes and regulations of the State providing for the protection of resources, the environment, or public health, safety or general welfare, impose additional requirements to, or more stringent standards than, those required by the Federal terms and stipulations for pipeline construction, operation or maintenance, the State law will control.

4. On lands subject to the State right-of-way lease, the determination of compliance with those terms and stipulations regulating the construction of the pipeline system which do not directly affect the physical integrity of the pipeline, but which are necessary for the protection of State lands and resources shall be made exclusively by the State. On such lands the State or the Department may issue any orders necessary to assure compliance with those terms and stipulations regulating the construction of the pipeline system that are necessary to protect the physical integrity of the pipeline.

5. The Parties recognize that the unique characteristics of the arctic and subarctic environment require special efforts to provide it with optimum protection. The Parties will make every reasonable effort to ensure that construction and operation methods and activities will be planned and executed so as to minimize environmental degradation.

6. Fish and wildlife protection is regarded by the Parties as a special responsibility of the surveillance effort which extends with common concern over the length of the pipeline. The Parties will encourage the formation, to the extent practicable, of a cooperative effort for such protection, sharing the fish and game personnel and information resources of both the State and Federal Governments, and the application of this cooperative effort over both State and Federal lands.

7. The Department shall have full and free access at all times to the Valdez terminal site for the purpose of enforcing the Department's stipulations at that facility. The State will assure such access to the Department by making appropriate provisions therefor in any lease or conveyance it may issue or grant with respect to the lands embraced in the Valdez terminal site.

III. STATE HIGHWAY AND STATE AIRPORTS

1. The Department agrees to take such action pursuant to the Trans-Alaska Pipeline Authorization Act of November 16, 1973, P.L. 93–153, as are necessary for the State to construct a public highway from the Yukon River to Prudhoe Bay. The State agrees to construct the highway according to the Highway and Airport Stipulations attached hereto as Exhibit "A" and, if the State contracts to build the highway, to include said stipulations as a part of any agreement with its contractors.

2. The State has furnished the Department a map of the intended location of the highway, and upon completion of construction of the highway will file with the Department a map of definite location of the highway of similar scale.

3. The Department agrees to lease three sites for public airports pursuant to the Trans-Alaska Pipeline Authorization Act (*supra*). The State agrees to build the airports according to those provisions of the Highway and Airport Stipulations that are pertinent to airport construction, and if the State contracts to build the airports, to include said stipulations as a part of any agreement with such contractors.

4. The Department agrees to take all actions necessary to provide to the State, under nonexclusive permits, the free use of gravel or other materials necessary for construction of the State highway and the State airports pursuant to the Trans-Alaska Pipeline Authorization Act (*supra*). All free use permits issued by the Department for such material sites shall include provisions of the Highway and Airport Stipulations applicable to material sites.

5. The State shall have the right and responsibility to enforce the applicable provisions of the Highway and Airport Stipulations referring to the construction of the State highway and State airports.

IV. MISCELLANEOUS

1. The Federal Authorized Officer and the State Pipeline Coordinator will develop procedures to implement the provisions of this agreement.

2. In the implementation of this agreement, each Party will avoid unnecessary employment of personnel and needless expenditure of funds.

3. This agreement shall remain in effect until construction of the Trans-Alaska pipeline is completed. However, in the event that either Party deems it necessary or desirable to terminate this agreement at an earlier time, it may do so after giving the other Party sixty (60) days advance written notice thereof.

IN WITNESS WHEREOF, the Parties hereto have executed this agreement as of the date shown below:

STATE OF ALASKA
/s/ WILLIAM A. EGAN
Title: Governor
State of Alaska
January 8, 1974

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
/s/ ROGERS C. B. MORTON
Title: Secretary of the Interior

EXHIBIT A

Highway and Airport Stipulations

1. DEFINITIONS

1.1. "Highway" means the State highway from the Yukon River to Prudhoe Bay, Alaska; and includes all permanent roads, bridges, tunnels, drainage structures, signs, guardrails, protective structures, and appurtenances related thereto or used in connection therewith.

1.2. "Airports" means the three public airports for which the State of Alaska made application on March 20, 1970, under 49 U.S.C. §§ 211–214 (1970).

1.3. "State Pipeline Coordinator" means that individual designated by the State of Alaska with authority over and responsibility for the supervision of design review and construction of the Pipeline System or his designee.

1.4. "Federal Authorized Officer" means the Secretary of the Interior, or a person delegated to exercise his authority with respect to the Pipeline System.

1.5. "Contractor" means the individual, corporation, or other entity, or the subcontractor or agent of such individual, corporation or other entity, with which the State of Alaska contracts to build the Highway or Airports. In the event that the State undertakes to build the Highway or Airports itself, "Contractor" shall mean the State of Alaska.

1.6. "Notice to Proceed" means a document signed by the State Pipeline Coordinator authorizing some aspect of the construction of the Highway or Airports.

2. PROCEDURES

2.1. Regulation of Public Access

2.1.1. During construction of the Highway, the State shall provide alternative routes for existing roads and trails across public lands.

2.1.2. The State shall make provisions for suitable permanent crossings for the public where the Highway right-of-way crosses existing roads, foot-trails, winter trails, or other rights-of-way.

2.2. Applicability of Stipulations

2.2.1. Nothing in these Stipulations shall be construed as applying to activities of the State that have no relation to the Highway or Airports.

2.2.2. Nothing in these Stipulations shall be construed to affect any right or cause of action that otherwise would be available to the State against any person other than the United States.

2.3. Responsibilities

2.3.1. With regard to the construction of the Highway and Airports: (1) The State shall ensure full compliance with the terms and conditions of these Stipulations by its agents, employees and contractors (including subcontractors of any tier), and the employees of each of them. (2) Unless clearly inapplicable, the requirements and prohibitions imposed upon the State by these Stipulations are also imposed upon the State's agents, employees, contractors, and subcontractors, and the employees of each of them. (3) Failure or refusal of the State's agents, employees, contractors, subcontractors, or their employees to comply with these Stipulations shall be deemed to be the failure or refusal of the State. (4) The State shall require its agents, contractors, and subcontractors to include these Stipulations in all contracts and sub-

contracts which are entered into by any of them, together with a provision that the other contracting party, together with its agents, employees, contractors, subcontractors, and the employees of each of them, shall likewise be bound to comply with these Stipulations.

2.3.2. The State shall make separate application, under applicable statutes and regulations, for authorization to use or occupy Federal lands in connection with the Highway or Airports where the lands are not within the Highway right-of-way or Airport leases. This shall include material sites, camp sites, waste areas, storage areas, access roads, etc.

2.3.3. The Federal Authorized Officer may require modification of the Highway or Airports, without liability or expense to the United States, as necessary to protect the integrity of the Trans-Alaska Pipeline.

2.4. Highway Design Approval

2.4.1. The State shall require detailed design submittals from Contractor for all river and stream crossings.

2.4.2. All such submittals shall be reviewed by the State Pipeline Coordinator for conformity with the Stipulations set forth herein.

2.4.3. Upon approval of such design, a Notice to Proceed shall be executed and transmitted to the Contractor. Such document shall authorize the commencement of construction on the element of the Highway for which design is approved.

2.5. Suspension of Construction

2.5.1. In the event the State Pipeline Coordinator determines that the Contractor is in violation of these Stipulations, he may order suspension of that portion of the work in violation.

2.5.2. In the event that the Federal Authorized Officer determines that the Contractor is in violation of these Stipulations, he may recommend that the State Pipeline Coordinator order suspension of that portion of the work he deems to be in violation.

2.6. Changes in Conditions

Unforeseen conditions arising during design or construction of the Highway or Airports may make it necessary to revise or amend these Stipulations to protect the environment and the public interest. In that event, the Federal Authorized Officer and the State Pipeline Coordinator, shall agree as to what revisions or amendments shall be made. If they are unable to agree, the Federal Authorized Officer shall have final authority to determine the matter if the Airports are involved, and the State Pipeline Coordinator shall have final authority to determine the matter if the Highway is involved.

3. CONTRACTOR STIPULATIONS—GENERAL

3.1. Equal Employment Opportunity

By accepting this contract, Contractor agrees that, during the period of construction of the Highway and Airports, or for so long as this permit shall be in effect, whichever is the longer, he shall comply with this Stipulation.

3.1.1. Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. Contractor will take affirmative action to ensure that applicants are employed, and that employees are equally treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be approved by the Authorized Officer setting forth the provision of this equal opportunity clause.

3.1.2. Contractor will, in all solicitations or advertisements for employees placed by or on behalf of Contractor, state that all qualified applicants will receive consideration for employment without regard to race, religion, sex, color or national origin.

3.1.3. Contractor will send to each labor union or representative of workers with which Contractor has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the Authorized Officer, advising the labor union or worker's representatives of Contractor commitments under this equal opportunity clause and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

3.1.4. Contractor will comply with Executive Order No. 11246 of September 24, 1965, as amended, and rules and regulations and relevant orders of the Secretary of Labor.

3.1.5. Contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, as amended, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to Contractor's books, records, and accounts by the State Pipeline Coordinator and the Federal Authorized Officer and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

3.1.6. In the event of Contractor's noncompliance with this equal opportunity clause or with any of said rules, regulations, or orders, this contract may be cancelled, terminated or suspended in whole or in part and Contractor may be declared ineligible for further government contracts or permits in accordance with procedures authorized in Executive Order No. 11246 of September 24, 1965, as amended, and such other sanctions may be imposed and remedies invoked as provided in Executive Order No. 11246 of September 24, 1965, as amended, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

3.1.7. Contractor will include the provisions of this equal opportunity clause in every contract, subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, as amended, so that such provisions will be binding upon each contractor, subcontractor or vendor. Contractor will take such action with respect to any contract, subcontract, or purchase order as the Authorized Officer may direct as a means of enforcing such provisions including sanctions for noncompliance; provided, however, that in the event Contractor becomes involved in, or is threatened with, litigation with a contractor, subcontractor or vendor as a result of such direction by the State Pipeline Coordinator, Contractor may request the United States to enter into such litigation to protect the interests of the United States.

3.1.8. Contractor further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work.

3.1.9. Contractor agrees that it will assist and cooperate actively with the State Pipeline Coordinator and the Federal Authorized Officer and the Secretary of Labor in obtaining the compliance of Contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the State Pipeline Coordinator and the Federal Authorized Officer and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the State Pipeline Coordinator in securing compliance.

3.1.10. Contractor further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order No. 11246 of September 24, 1965, as amended, with a Contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon Contractors and subcontractors by the Federal Authorized Officer or the Secretary of Labor, pursuant to Part II, Subpart D, of the Executive Order. In addition, Contractor agrees that if it fails or refuses to comply with these undertakings, the State Pipeline Coordinator may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this contract; refrain from extending any further assistance to Contractor under the program with respect to which the failure or refusal occurred until satisfactory assurance of future compliance has been received from the Contractor; and refer the case to the Department of Justice for legal proceedings.

3.1.11. Certification of Nonsegregated Facilities

By accepting this contract, Contractor certifies that Contractor does not and will not maintain or provide for Contractor's employees any segregated facilities at any of Contractor's establishments, and that Contractor does not and will not permit Contractor's employees to perform their services at any location, under Contractor's control, where segregated facilities are maintained. Contractor agrees that a breach of this certification is a violation of the equal opportunity clause of this permit. As used in this certification, the term "segregated facilities" means, but is not limited to, any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains,

recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin, because of habit, local custom or otherwise. Contractor further agrees that (except where Contractor has obtained identical certifications from proposed Contractors and subcontractors for specific time periods) Contractor will obtain identical certifications from proposed Contractors and subcontractors prior to the award of contracts or subcontracts exceeding $10,000 which are not exempt from the provisions of the equal opportunity clause; the Contractor will retain such certifications in Contractor's files; and the Contractor will forward the following notice to such proposed Contractors and subcontractors (except where the proposed Contractors or subcontractors have submitted identical certifications for specific time periods): "NOTICE TO PROSPECTIVE CONTRACTORS AND SUBCONTRACTORS OF REQUIREMENT FOR CERTIFICATION OF NON-SEGREGATED FACILITIES." A Certification of Nonsegregated Facilities, as required by the order (32 F.R. 7439, May 19, 1967) on Elimination of Segregated Facilities, by the Secretary of Labor, must be submitted prior to the award of a contract or subcontract exceeding $10,000 which is not exempt from the provisions of the equal opportunity clause. The certification may be submitted either for each contract and subcontract or for all contracts and subcontracts during a period (i.e., quarterly, semiannually, or annually).

3.2. Liabilities and Responsibilities of Contractor

Contractor shall abate any condition existing with respect to the construction of the Highway or Airports that causes or threatens to cause serious and irreparable harm or damage to any person, structure, property, land, fish and wildlife and their habitats, or other resource. Any State or Federal property and fish and wildlife habitat harmed or damaged by the Contractor in connection with the construction of the Highway or Airports, regardless of fault, shall be reconstructed, repaired and rehabilitated by the Contractor to the written satisfaction of the State Pipeline Coordinator. Contractor shall be liable in accordance with applicable laws for loss or damage to property of others or for bodily injuries to or the death of any person arising from or connected with the construction of the Highway or Airports.

3.3. Federal, State and Local Laws and Regulations

Contractor shall comply with applicable Federal and State laws and all regulations issued thereunder, existing or hereafter enacted or promulgated, affecting in any manner construction of the Highway or Airports.

3.4. Antiquities and Historical Sites

Contractor shall engage an archeologist approved by the Federal Authorized Officer to provide surveillance and inspection of the Highway and Airport sites for archeological values. If, in connection with any operation under this contract, or any other contract entered in connection with the Highway or Airports, Contractor encounters known or previously unknown paleontological, archeological, or historical sites, Contractor shall immediately notify the Federal Authorized Officer and the State Pipeline Coordinator and said archeologist. Contractor's archeologist shall investigate and provide an on-the-ground opinion regarding the protective measures to be undertaken by Contractor. The Federal Authorized Officer may suspend that portion of Contractor's operations necessary to preserve evidence pending investigation of the site.

Six (6) copies of all survey and excavation reports shall be filed with the Federal Authorized Officer and the State Pipeline Coordinator.

3.5. Termination of Use

Upon termination of use of any part of the Highway or Airports, Contractor shall remove all improvements and equipment, except as otherwise approved in writing by the State Pipeline Coordinator as to the Highway, and the Federal Authorized Officer as to the Airports, and shall restore the land to a condition that is satisfactory to them. The satisfaction of the State Pipeline Coordinator and Federal Authorized Officer shall be stated in writing.

All Access Roads shall be "put-to-bed" by Contractor upon completion of their use unless otherwise directed by the Federal Authorized Officer. "Put-to-bed" is used herein to mean that such roads shall be left in such stabilized condition that erosion will be minimized through the use of adequately designed and constructed waterbars, revegetation, and chemical surface control; that culverts and bridges shall be removed by Contractor in a manner satisfactory to the Federal Author-

ized Officer; and that such roads shall be closed to use. Contractor's rehabilitation plan shall be approved in writing by the State Pipeline Coordinator and the Federal Authorized Officer prior to termination of use of any such road or any part thereof.

3.6. Public Improvements

Contractor shall protect existing improvements on Federal and State lands during construction of the Highway or Airports. Except as authorized for temporary purposes by the State Pipeline Coordinator and Federal Authorized Officer, the Contractor shall not obstruct any road or trail with logs, slash, or debris.

3.7. Camping, Hunting, Fishing, and Trapping

Contractor shall satisfy the State Pipeline Coordinator that it has and will adequately inform its employees, agents, contractors, subcontractors, and their employees, of applicable laws and regulations relating to hunting, fishing, and trapping.

3.8. Small Craft Passage

The creation of any permanent obstruction to the navigation of small craft in streams is prohibited.

3.9. Survey Monuments

Contractor shall mark and protect all geodetic survey monuments encountered during the construction of the Highway or Airports. These monuments are not to be disturbed; however, if such a disturbance occurs, the Federal Authorized Officer shall be immediately notified thereof in writing.

If any land survey monuments, corners, or accessories (excluding geodetic survey monuments) are destroyed, obliterated or damaged, Contractor shall employ a qualified land surveyor to reestablish or restore same in accordance with the "Manual of Instructions for the Survey of Public Lands" and shall record such survey in the appropriate records. Additional requirements for the protection of monuments, corners, and bearing trees may be prescribed by the Federal Authorized Officer.

3.10. Fire Prevention and Suppression

Contractor shall promptly notify the State Pipeline Coordinator and the Federal Authorized Officer and take all measures necessary and appropriate for the prevention and suppression of fires in accordance with 43 CFR 2801.1–5(d). Contractor shall comply with their instructions and directions concerning the use, prevention and suppression of fires. Use of open fi : in connection with construction of the Highw: or Airports is prohibited unless authorized in writing by the State Pipeline Coordinator as to ıe Highway or the Federal Authorized Officer a: o the Airports.

3.11. Health and Safety

Contractor shall take all meas es necessary to protect the health and safety o ıll persons affected by its activities perform in connection with the construction of the Higl ay or Airports and shall immediately abate any ealth or safety hazards. Contractor shall immed ıately notify the State Pipeline Coordinator of a l serious accidents which occur in connection th such activities.

4. CONTRACTOR STIPUL TIONS—ENVIRONMENTAL

4.1. Environmental Briefing

Prior to and during construct ı of the Highway and Airports, Contractor s ıll provide for environmental and other pertin ıt briefings of construction and other personnel y such Federal and State employees as may be d ignated by the Federal Authorized Officer and th State Pipeline Coordinator. Contractor shall a unge the time, place and attendance for such br ngs upon their request.

4.2. Pollution Control

4.2.1. General

Contractor shall conduct all a tivi ies associated with the Highway and Airports in a manner that will avoid or minimize degradation of air, land and water quality. In the construction of the Highway and Airports, Contractor shall perform its activities in accordance with applicable air and water quality standards and related plans of implementation, including emission standards, adopted pursuant to the Clean Air Act, as amended (42 U.S.C., sec. 1857, et seq.), and the Federal Water Pollution Control Act, as amended (33 U.S.C., sec. 1160).

4.2.2. Water and Land Pollution

4.2.2.1. Contractor shall comply with applicable "Water Quality Standards" of the State of Alaska as approved by the Environmental Protection Agency.

4.2.2.2. Mobile ground equipment shall not be operated in lakes, streams, or rivers unless such operation is approved in writing by the State Pipeline Coordinator.

4.2.3. Air Pollution and Ice Fog

4.2.3.1. Contractor shall utilize and operate all facilities and devices used in connection with the construction of the Highway and Airports in such a way so as to avoid or minimize air pollution and ice fog.

4.2.3.2. Emissions from equipment, installations, and burning materials shall meet applicable Federal and State air quality standards.

4.2.4. Pesticides, Herbicides, and other Chemicals

Contractor shall use only non-persistent and immobile types of pesticides, herbicides and other chemicals. Each chemical to be used and its application constraint shall be approved in writing by the State Pipeline Coordinator prior to use.

4.2.5. Sanitation and Waste Disposal

4.2.5.1. "Waste" means all discarded matter, including but not limited to human waste, trash, garbage, refuse, oil drums, petroleum products, ashes and equipment.

4.2.5.2. All waste generated in construction of the Highway and Airports shall be removed or otherwise disposed of in a manner acceptable to the State Pipeline Coordinator. All applicable standards and guidelines of the Alaska State Department of Environmental Conservation, the United States Public Health Service, the Environmental Protection Agency, and other Federal and State agencies shall be adhered to by Contractor. All incinerators shall meet the requirements of applicable Federal and State laws and regulations and shall be used with maximum precautions to prevent forest and tundra fires. After incineration, material not consumed in the incinerator shall be disposed of in a manner approved in writing by the State Pipeline Coordinator. Portable or permanent waste disposal systems to be used shall be approved in writing by the State Pipeline Coordinator.

4.3. Buffer Strips

4.3.1. Public Interest Areas

No construction activity in connection with the Highway or Airports shall be conducted within one-half (½) mile of any officially designated Federal, State or municipal park, wildlife refuge, research natural area, recreation area, recreation site, or any registered National Historic Site or National Landmark, unless such activity is approved in writing by the Federal Authorized Officer as to Federal areas or the State Pipeline Coordinator as to State areas.

4.3.2. Streams

The Highway clearing limits shall be limited so as to provide three hundred (300) foot minimum buffer strips of undisturbed land along streams unless otherwise approved under 2.4 herein.

4.4. Erosion Control

4.4.1. Contractor shall conduct all Highway and Airport construction activities so as to avoid or minimize disturbance to vegetation.

4.4.2. The design of the Highway and Airports shall provide for the construction of erosion control facilities that will avoid or minimize erosion.

4.4.3. The erosion control facilities shall be constructed to avoid erosion and to lessen the possibility of forming new drainage channels resulting from Highway or Airport construction activities. The facilities shall be designed and constructed in such a way as to avoid or minimize disturbance to the thermal regime.

4.4.4. Stabilization

4.4.4.1. Surface materials taken from disturbed areas shall be stockpiled and utilized during restoration unless otherwise approved in writing by the State Pipeline Coordinator as to the Highway and by the Federal Authorized Officer as to the Airports. Stabilization practices, as determined by the needs for specific sites, shall include but shall not be limited to seeding, planting, mulching, and the placement of mat binders, soil binders, rock or gravel blankets, or structures.

4.4.4.2. All disturbed areas shall be left in a stabilized condition satisfactory to the State Pipeline Coordinator as to the Highway and the Federal Authorized Officer as to the Airports. Such satisfaction shall be stated in writing.

4.4.5. Crossings of Streams, Rivers or Flood Plains

4.4.5.1. Contractor shall prevent or minimize erosion at streams and river crossings and those parts of the Highway or Airports within flood plains.

4.4.5.2. Temporary access over stream banks shall be made through use of fill ramps rather than by cutting through stream banks, unless otherwise approved in writing by the State Pipeline Coordinator.

4.4.5.3. Timing and methods of crossings shall be subject to control and alteration by the State Pipeline Coordinator to protect fish passage and spawning and aquatic resources generally.

4.4.6. Seeding and Planting

Seeding and planting of disturbed areas shall be conducted as soon as practicable and, if necessary, shall be repeated until vegetation is successful, unless otherwise approved in writing by the State Pipeline Coordinator. All other restoration shall be completed as soon as possible.

4.4.7. Excavated Material

Excavated material not utilized for Highway or Airport construction shall be disposed of in a manner approved in writing by the Federal Authorized Officer, if wasted outside of the facility right-of-way.

4.5. Fish and Wildlife Protection

4.5.1. Passage of Fish

4.5.1.1. Contractor shall provide for uninterrupted movement and safe passage of fish. Any artificial structure or any stream channel change that would cause a blockage of fish shall be provided with a fish passage structure or facility that meets all Federal and State requirements. The proposed design shall be submitted to the State Pipeline Coordinator in accordance with Stipulation 2.4.1.

4.5.1.2. Pump intakes shall be screened to prevent harm to fish.

4.5.1.3. Abandoned water diversion structures shall be removed or filled to prevent trapping or stranding of fish.

4.5.1.4. If material sites are approved adjacent to or in certain lakes, rivers, or streams, the State Pipeline Coordinator, either on his own initiative or at the request of the Federal Authorized Officer, may require the Contractor to construct levees, berms, or other suitable means to protect fish and fish passage and to prevent siltation of streams or lakes.

4.5.2. Fish Spawning Beds

4.5.2.1. "Fish Spawning Beds" means the areas where anadromous and resident fish deposit their eggs.

4.5.2.2. Contractor shall avoid channel changes in Fish Spawning Beds designated by the State Pipeline Coordinator; however, where channel changes cannot be avoided in such beds, new channels shall be constructed according to written standards supplied by the State Pipeline Coordinator.

4.5.2.3. Fish Spawning Beds shall be protected from sediment where soil material is expected to be suspended in water as a result of construction activities. Settling basins shall be constructed to intercept silt before it reaches streams or lakes.

4.5.2.4. Contractor shall comply with any special requirements made by the State Pipeline Coordinator for a stream system in order to protect Fish Spawning Beds. Contractor shall repair all damage to Fish Spawning Beds caused by construction of the Highway or Airports.

4.5.3. Zones of Restricted Activities

Contractor's activities in connection with the construction of the Highway or Airports in key fish and wildlife areas may be restricted by the State Pipeline Coordinator during periods of fish and wildlife breeding, nesting, spawning, lambing or calving activity and during major migrations of fish and wildlife. The State Pipeline Coordinator shall provide Contractor written notice of such restrictive action. From time to time, the State Pipeline Coordinator shall furnish Contractor a list of areas where such actions may be required, together with anticipated dates of restriction.

4.6. Material Sites

4.6.1. Acquisition of Materials

4.6.1.1. If Contractor requires materials from the public lands, Contractor shall request the State of Alaska to make application, in accordance with 43 CFR, Part 3621, "Free Use of Mineral Materials." Contractor shall submit a mining plan in accordance with 43 CFR, Part 23. No materials may be removed by Contractor without the written approval of the Federal Authorized Officer.

4.6.1.2. Insofar as possible, use of existing material sites will be authorized in preference to new sites.

4.6.2. Layout of Material Sites

Material site boundaries should be shaped in such a manner as to blend with surrounding natural land patterns. Regardless of the layout of material sites, primary emphasis shall be placed on prevention of soil erosion and damage to vegetation.

4.7. Clearing

4.7.1. Boundaries

Contractor shall identify approved clearing boundaries on the ground prior to beginning clearing operations. All timber and other vegetative material outside clearing boundaries and all blazed, painted or posted trees which are on or mark clearing boundaries are reserved from cutting and removal with the exception of danger

trees or snags designated as such by the State Pipeline Coordinator.

4.7.2. Timber

4.7.2.1. Prior to initiating clearing operations, Contractor shall notify the Federal Authorized Officer of the amount of merchantable timber, if any, which will be cut, removed, or destroyed in the construction of the Highway or Airports, and shall request that the State make separate application for the free use of such timber in accordance with 43 CFR, Part 5510.

4.7.2.2. All trees, snags, or other woody material cut in connection with clearing operations shall be cut so the resulting stumps shall not be higher than six (6) inches measured from the ground on the uphill side.

4.7.2.3. All trees, snags, and other woody material cut in connection with clearing operations shall be felled into the area within the clearing boundaries and away from water courses.

4.7.2.4. Hand clearing shall be used in areas where the State Pipeline Coordinator as to the Highway and the Federal Authorized Officer as to the Airports, determine that use of heavy equipment would be detrimental to existing conditions.

4.7.2.5. All debris resulting from clearing operations and construction that may block stream flow, delay fish passage, contribute to flood damage, or result in stream bed scour or erosion shall be removed.

4.7.2.6. Logs shall not be skidded or yarded across any stream without the written approval of the State Pipeline Contractor.

4.7.2.7. No log landing shall be located within three hundred (300) feet of any water course, except where impractical, then only with the written approval of the State Pipeline Coordinator.

4.7.2.8. All slash shall be disposed of within the Highway right-of-way or Airport lease unless otherwise directed in writing by the Federal Authorized Officer as to the Airports or the State Pipeline Coordinator as to the Highway.

4.8. Disturbance of Natural Waters

All activities of Contractor in connection with the construction of the Highway or Airports that may create new lakes, drain existing lakes, significantly divert natural drainages, permanently alter stream hydraulics, or disturb significant areas of stream beds are prohibited unless such activities along with necessary mitigation measures are approved in writing by the Federal Authorized Officer as to the Airports and the State Pipeline Coordinator as to the Highway.

4.9. Off Right-of-Way Traffic

Contractor shall not operate mobile ground equipment off the Highway or Airport constructions limits or authorized areas unless approved in writing by the Federal Authorized Officer as to the Airports and the State Pipeline Coordinator as to the Highway, or when necessary to prevent harm to any person.

4.10. Aesthetics

The Federal Authorized Officer or State Pipeline Coordinator may impose such requirements as he deems necessary to protect aesthetic values.

4.11. Restoration

4.11.1. Areas disturbed by Contractor shall be restored by Contractor to the satisfaction of the State Pipeline Coordinator as to the Highway, and the Federal Authorized Officer as to the Airports. as stated in writing.

4.11.2. All cut and fill slopes shall be left in a stable condition.

4.11.3. Materials from the Highway and Airports, haul ramps, berms, dikes, and other earthen structures shall be disposed of as directed by the State Pipeline Coordinator as to the Highway and the Federal Authorized Officer as to the Airport.

4.11.4. Vegetation, overburden, and other materials removed during clearing operations shall be disposed of by Contractor in a manner approved in writing by the State Pipeline Coordinator as to the Highway and the Federal Authorized Officer as to the Airports.

4.11.5. Upon completion of restoration, Contractor immediately shall remove all equipment and supplies from the site.

5. CONTRACTOR STIPULATIONS—TECHNICAL

The following requirements shall be complied with in design and construction of Highways and Airports.

5.1. Special Standards

5.1.1. All preconstruction, construction, and post-construction operations shall be conducted to minimize permafrost degradation and damage to the environment, and to provide maximum protection to wildlife and human beings.

5.1.2. Temporary bridges shall be located so as to reserve the superior site and alignment for future permanent bridges.

5.1.3. Embankment sections shall be used in preference to excavated sections wherever practicable and, in general, the Highway shall follow terrain features.

5.1.4. Unless otherwise approved by the State Pipeline Coordinator, organic material resulting from clearing operations shall not be incorporated in the road prism, but may be used as a mat overlay below the road prism.

5.2. Permanent Culverts and Bridges

Culverts and bridges shall be designed to accommodate a 50-year flood in accordance with criteria established by the American Association of State Highway Officials and the Federal Highway Administration.

5.3. Erosion

5.3.1. Erosion control procedures shall accommodate and be based on the runoff produced by storm and snow melt conditions having a 50-year occurrence interval. The procedure shall also accommodate effects that result from thawing produced by flowing or ponded water on permafrost terrain.

5.3.2. Slopes of cuts through stream banks shall be designed and constructed to minimize erosion and prevent slides.

5.3.3. Where necessary because of outfall erosion, stilling basins shall be constructed at the outflow end of culverts. To prevent erosion the pool sides shall be established by appropriate methods; e.g., by the use of riprap.

5.4. Slope Stability

Areas subject to mudflows, landslides, mudslides, avalanches, rock falls, and other types of mass movements shall be avoided where practicable in locating the Highway and Airports. Where such avoidance is not practical, the Highway or Airport design, based upon detailed field investigations and analysis, shall provide measures to prevent the occurrence of, or protect the Highway or Airports against the effects of mass movements.

5.5. Construction Operations

5.1.1. All pre-construction and construction activities shall be conducted so as to avoid or minimize thermal and other environmental changes and to provide maximum protection to fish and wildlife and their habitat, and people. All surface modifications shall be planned and executed in such a way that any resulting degradation of permafrost will not jeopardize adjoining structure foundations.

5.5.2. Acceptable plans, procedures and quality controls that ensure compliance with these Stipulations shall be submitted in accordance with Stipulation 2.4.1.